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REALTRAIN VALIDATION FOR ARMOR/ANTI-ARMOR TEAMS

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ENGAGEMENT SIMULATION TECHNICAL AREA

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U. S. Army

Research Institute for the Behavioral and Social Sciences

March 1979

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Item 20 (continued)

In general, REALTRAIN units improved more than conventional units and achieved higher performance levels.

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Research Report 1204

REALTRAIN VALIDATION FOR ARMOR/ANTI-ARMOR TEAMS

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Tactical Team Performance

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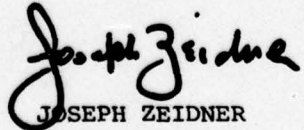
FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has developed a broad program for more effective training of combat units in the Army. The U.S. Army Training and Doctrine Command (TRADOC) has identified small-unit tactical engagement simulation training as one of its highest behavioral science research priorities. One product of ARI's research program is a tactical engagement simulation training method known as REALTRAIN that provides extremely realistic and motivating training for small combat-arms units. The method is described in ARI Technical Report S-4 and ARI Research Reports 1191, 1192, and 1203.

To validate REALTRAIN, ARI has projected a series of field tests supported by personnel of the ARI Presidio of Monterey Field Unit, Jack J. Sternberg, Chief. This report, one of a series, presents partial findings of an experiment conducted at Fort Carson, Colo., January-March 1978. In addition to the authors, members of the core team that planned and executed the validation test were LTC Thomas J. Ritenour and Patrick Whitmarsh of the ARI Field Unit at Presidio of Monterey and E. Robert Clovis and Robert F. Cunningham of Canyon Research Group, Inc. F. H. Steinheiser, Jr., Gary Boycan, Steven Medlin, and Bruce Hamill of the Engagement Simulation Technical Area, ARI, also gave assistance.

LTC Thomas J. Ritenour of the ARI field unit contributed outstandingly and was responsible for organizing and supervising the military support aspects of the field experiment. This research could not have been accomplished without the support of the 4th Infantry Division (Mechanized). Special thanks are due to the conventional trainer, CPT James L. Prewett of the 4th Division, and the REALTRAIN trainer, MAJ Angelo Severino, Office of TRADOC Systems Manager for Tactical Engagement Simulation (TSM-TES). Finally, COL George J. Stapleton, TSM-TES, provided support and encouragement.

This research was conducted within the December 1976 Five Year Test Program (FYTP) as approved by the Army Test Schedule and Review Committee (TSARC). The entire program is responsive to the requirements of Army projects 2Q763743A773 and 2Q763743A780 and the TRADOC Systems Manager for Tactical Engagement Simulation of the U.S. Army Training Support Center, Fort Eustis, Va. The research reported here was conducted as part of Army project 2Q763743A775.


JOSEPH ZEIDNER
Technical Director

REALTRAIN VALIDATION FOR ARMOR/ANTI-ARMOR TEAMS

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REALTRAIN VALIDATION FOR ARMOR/ANTI-ARMOR TEAMS

BRIEF

Requirements:

To compare and evaluate the tactical performance of Armor/Anti-Armor teams trained with REALTRAIN engagement simulation methods and Armor/Anti-Armor teams trained by conventional combat field training methods.

Procedure:

In Phase I, eight tank platoons with attached TOW antitank weapon and forward observer sections from the 4th Infantry Division (Mechanized) at Fort Carson, Colo., engaged in pretest field exercises to establish pretraining performance levels. This pretest included a movement-to-contact attack, and a defense against a skilled opposing force.

Phase II provided 5 days of carefully coordinated tactical training by REALTRAIN methods for four units and by conventional methods for four units.

Phase III, the posttest, repeated the pretest on different terrain to establish performance improvement after training.

In Phase IV, test units conducted two meeting engagements against tested units of the other training group (shoot-off exercises).

Findings:

Results were assessed for both attack and defense in terms of mission accomplishment, casualties inflicted and sustained, and detections by the tested units and their opposing forces (10 measures).

All units performed at similar levels in pretraining tests. In posttraining tests, REALTRAIN units improved on an average of about eight measures; conventionally trained units, on about four measures. REALTRAIN units won six of seven shoot-off engagements and sustained fewer and inflicted more casualties than did conventionally trained units.

Utilization of Findings:

Results from this portion of the field assessment of REALTRAIN provide empirical evidence, gathered under a systematic and comprehensive field research program, of the greater effectiveness of REALTRAIN over conventional combat unit training for Armor/Anti-Armor teams. The Army is using REALTRAIN methods now, and these methods will form the core of a total engagement simulation system for training and evaluation. The performance characteristics of Armor/Anti-Armor teams will provide a basis for the improvement of Army training and evaluation programs.

REALTRAIN VALIDATION FOR ARMOR/ANTI-ARMOR TEAMS

INTRODUCTION

The improvement of tactical training is one of the highest Army priorities. In recent years, the Army has sought to increase the effectiveness of unit training through the introduction of the Army Training and Evaluation Program (ARTEP). The major thrust of the ARTEP has been to place increased emphasis on development of performance-oriented training and evaluation methods.

The current ARTEP stresses that unit proficiency should be judged on the basis of performance of appropriate missions carried out with as much tactical realism as possible. Consistent with these emphases, a variety of engagement simulation tactical training techniques have been developed which promise to increase greatly the effectiveness of combat-arms units.

The system called REALTRAIN, which is one of this family of engagement simulation techniques, is oriented toward the tactical training of small combat units. REALTRAIN has provided small-unit commanders with the capability to conduct two-sided, free-play tactical exercises with credible casualty assessment, weapon signature effects, and a high degree of tactical realism.

The Multiple Integrated Laser Engagement System (MILES), a further advance in tactical training technology, will provide commanders of units up through battalion level with a tactically realistic engagement simulation training methodology. Together, REALTRAIN and MILES provide the methodological foundation of a broad, performance-oriented training and evaluation program.

The Army Research Institute and TRADOC are conducting a research program to improve Army tactical training and evaluation. This program includes the development and testing of tactical engagement simulation training methods, such as REALTRAIN and MILES, and will provide a basis for improving existing ARTEPs. Not only will trainers be able to determine objectively the terminal mission outcomes (e.g., mission accomplishment and casualty exchange ratios), but they will also be assisted in determining proficiency on critical intermediate tasks.

Two major field experiments have been conducted to compare the training effectiveness of REALTRAIN with conventional training methods that do not use current engagement simulation techniques. The first experiment examined the tactical performance of dismounted

rifle squads.^{1,2} The second experiment examined the performances of Armor/Anti-Armor teams. This research report concerns the second experiment and presents information on product measures of performance and their immediate antecedents for Armor/Anti-Armor teams. Other measures of tactical performance will be explored in subsequent papers.

METHOD

The field experiment consisted of four phases of tactical training and performance testing, repeated in two cycles. Each player unit consisted of a tank platoon, a TOW antitank weapon section, and a forward observer from the 4th Infantry Division (Mechanized) at Fort Carson, Colo.

Phase I was a tactically realistic, ARTEP-based pretraining test administered to establish entry-level proficiency and to establish the equivalence of the units to be trained either by REALTRAIN or by conventional methods.

Phase II consisted of a 5-day training period during which player units received either REALTRAIN or conventional training.

Phase III was a posttraining test, conducted to determine the performance improvements resulting from training.

Phase IV consisted of two-sided, free-play exercises in which REALTRAIN and conventionally trained units opposed each other in a meeting engagement.

Pretraining and posttraining tests (Phases I and III) consisted of a movement-to-contact/attack followed by a defense. The scenario for these tests was based on guidance provided in ARTEP 17-35.

Two test lanes were selected based on terrain similarity to maintain tactical realism. Each unit was administered the pretraining test on one lane and the posttraining test on the other. In addition, order of lane use in pretests and posttests was counterbalanced to minimize any possible lane effects.

¹Banks, J. H., Hardy, G. D., Jr., Scott, T. D., Kress, G., & Word, L. REALTRAIN Validation for Rifle Squads: Mission Accomplishment. ARI Research Report 1192, October 1977. (ADA043515)

²Meliza, L. L., Scott, T. D., & Epstein, K. I. REALTRAIN Validation for Rifle Squads II: Tactical Performance. ARI Research Report 1203, March 1979.

Weapon systems played in the tests were the 105mm tank main gun, TOW heavy antitank weapon, and 155mm artillery.

Tested units were first given an operations order that directed them to occupy and secure an objective about 3 km from their attack position. The objective was defended by an opposing force (OPFOR) TOW section located forward of the objective and by two OPFOR tanks located on the objective. The test scenario called for the TOW section to withdraw when the lead element of the tested unit closed to within 400 m of the TOW section's position. The scenario also called for the OPFOR light tank section to remain on the objective until at least one OPFOR tank had been declared a casualty and tanks from the tested unit had closed to within 400 m.

In a subsequent portion of the scenario, tested units received orders to prevent OPFOR occupation of critical terrain for 1 hour. An OPFOR counterattack on the defended position was launched after the tested unit had sufficient time to prepare its defense. The OPFOR counterattack was made by a tank platoon and TOW section and was supported by indirect fire controlled through the OPFOR forward observer.

In the standardized counterattack scenario, the OPFOR TOWs provided overwatch while the light section and heavy section attacked along two likely avenues of approach. The exercise was terminated when either the first OPFOR tank occupied the key terrain specified in the tested unit's operations order or 60 minutes after initiation of the counterattack.

The OPFOR was given 2 weeks of tactical and scenario-specific training prior to the test to bring the force to a high level of tactical proficiency and to insure that their attacks and defenses during the pretraining and posttraining tests presented a standardized threat. The test conditions presented extremely different objectives for the tested units.

Upon completion of Phase I testing, units were assigned to either REALTRAIN or conventional training on the basis of casualties inflicted and sustained during pretests. Assignment procedures were designed to insure that training groups, as much as possible, were of equivalent tactical proficiency before the onset of training.

Phase II consisted of a 5-day training period during which units received either REALTRAIN training or conventional training. Conventional training was defined in terms of the absence of current engagement simulation techniques. Casualties could be declared by the trainer or umpires on the basis of criteria such as undue exposure of tactical vehicles, force ratios, etc. No umpire was allowed to act in a capacity similar to that of a REALTRAIN controller. Indirect fire was controlled through the trainer, training NCO, or an umpire, and no Fire Direction Center was employed.

Training was given by two highly experienced and accomplished armor officers. One trained the units with REALTRAIN; the other used conventional training methods. Both trainers were given the same training guidance, based on ARTEPs that were relevant to the missions and test unit composition. Both independently prepared a 5-day program of instruction (POI). Both POIs were reviewed and discussed with the trainer to insure that the POIs were comparable and that both trainers were training on the same missions, tasks, and conditions.

Phase IV consisted of tactical exercises in which REALTRAIN and conventionally trained units opposed each other in free-play meeting engagements. In each cycle, each unit participated in two exercises in which it opposed each of the units in the other training group. Two test lanes were used. For a test lane, each unit was given a separate written order from its simulated company team commander that insured a meeting engagement between the two units. Order of use of the lanes and direction of movement on the lanes were counterbalanced for REALTRAIN and conventional units to overcome any potential biasing effects caused by terrain characteristics. Once contact was made, engagements continued until all tanks on one side had been destroyed.

RESULTS

REALTRAIN and conventional unit performances were similar in pretraining tests. Both groups improved after 5 days of tactical training. REALTRAIN units generally improved more than conventionally trained units. In posttraining tests, REALTRAIN units performed better than conventionally trained units in that they

- Accomplished more missions,
- Sustained fewer casualties,
- Inflicted more casualties, and
- Were less often detected by the OPFOR.

Although REALTRAIN units detected the OPFOR more frequently than conventional units, the difference was not substantial.

In shoot-off exercises, REALTRAIN units

- Defeated conventionally trained units in six out of seven meeting engagements,
- Sustained fewer casualties than conventional units, and
- Inflicted more casualties than conventional units.

To determine the scope of pretest to posttest improvement, each tested unit was scored on whether it improved on the basic five measures for both attack and defense. These measures consisted of (a) mission accomplishment, (b) casualties inflicted, (c) casualties sustained,

(d) detections by tested units, and (e) detections by the OPFOR. Results show that REALTRAIN units improved on an average of 7.8 measures, and conventional units, on 4.0 measures.

In addition, tested units were ranked in terms of their pretest and posttest performance on 10 measures. Pretest differences between REALTRAIN and conventional units were not significant. In posttests, however, REALTRAIN units were ranked significantly higher than conventional units. This finding is supported by the results (presented above) of the shoot-off meeting engagements.

This report is one in a series based on two major field experiments comparing REALTRAIN with conventional training. These experiments were conducted to validate the REALTRAIN training method and to identify critical measures of tactical performance for dismounted infantry units and Armor/Anti-Armor teams. Subsequent reports will explore process measures of the Armor/Anti-Armor units' tactical performance in detail. These reports will provide critical information required for the improvement of current ARTEPs.

TECHNICAL SUPPLEMENT

METHOD

The research was conducted at Fort Carson, Colo., January-March 1978. The 4th Infantry Division (Mechanized) at Fort Carson supplied player and support personnel. The purpose was to validate REALTRAIN training methodology and to identify critical measures of tactical performance for Armor/Anti-Armor units.

During the field experiment, eight test units underwent a program of tactical testing and training. Each was composed of one tank platoon, one TOW section, and one forward observer. The program consisted of a pretraining test, 5 days of tactical training, a post-training test, and tactical exercises in which test units trained by different methods opposed one another. Pretraining and posttraining tests were ARTEP-based tactical exercises in which test units performed against a well-trained, controlled opposing force (OPFOR).

Personnel

Army test personnel were assigned duty positions based on their individual qualifications. Personnel included data collectors, controllers, indirect fire personnel, mappers, radio control net operators, training officers and NCOs, and support personnel. Scientific staff members monitored all phases of testing and training to insure that test procedures and scenarios were accurately replicated.

Players and OPFOR. Players were members of eight test units from the 4th Division. Each test unit and the OPFOR consisted of a tank platoon with assigned TOW and forward observer (FO) sections. Once units were established, unit integrity was maintained for the duration of the experiment.

Controllers/Data Collectors. Sixteen individuals (2 officers and 14 enlisted men) acted as REALTRAIN controllers and data collectors aboard tactical vehicles, with one controller/data collector assigned to each vehicle. The two officers were assigned to the platoon leaders' tanks.

During all tests, an O-5 senior tactical controller accompanied the test unit and an O-2 senior OPFOR controller accompanied the OPFOR, each in a 1/4-ton vehicle. These two controllers were accompanied by civilian scientists who were responsible for the scientific execution of trials and the collection of performance data.

Indirect Fire. Eight individuals were responsible for executing the indirect fire missions called by tested units and OPFOR. Four of these manned the Fire Direction Center (FDC), recorded indirect fire data, plotted missions, and controlled the firemarkers. The remaining four were firemarkers and were responsible for placing ground burst simulators and smoke pots at the locations designated by the FDC.

Mappers. Ten individuals were responsible for recording routes and events on 1:25,000 maps. Five were assigned to the tested unit, and five were assigned to the OPFOR. Tested unit and OPFOR mappers were assigned corresponding positions. In each test exercise, one mapper was assigned to each of the two TOWs, one was assigned to the FO, one followed the heavy tank section in a 1/4-ton vehicle, and one followed the light tank section. Heavy and light section mappers were instructed to avoid compromising the routes or locations of their sections.

REALTRAIN Control Net Operators. Four enlisted men operated the REALTRAIN control net. They were responsible for insuring that communications checks were made, recording times of scenario events, transmitting the correct time, recording tactical events (casualties, etc.), and making tape recordings of tactical and control net communications.

Test Staff Training

General. All test staff personnel received intensive training on their duties for at least 1 week and became familiar with the tactical scenario and test lanes. Data forms were reviewed by members of the scientific staff at the end of practice exercises to insure that the data forms were being completed properly. The data forms used by controllers and other data collectors were modified in response to feedback provided by data collectors. Numbered checkpoints were placed in the field to assist mappers, controllers, and firemarkers.

Data Collectors. Controllers were trained during REALTRAIN mini-exercises and during OPFOR practice sessions for the tactical test. Members of the scientific staff accompanied controllers on tactical vehicles during this training period to facilitate controller training in data collection duties. Mapper data collectors were given extensive training and practice in map reading and in construction of map traces of vehicle routes. Net control station (NCS) personnel practiced first on tape-recorded simulated exercises and later on OPFOR practice exercises.

Indirect Fire. FDC personnel and firemarkers executed simulated indirect fire missions and later executed fire missions during OPFOR practice exercises. Firemarkers received at least 1 week of intensive training and practice. Formal training was given in map

reading, land navigation, handling of explosives, and REALTRAIN procedures for indirect fire. In practice sessions, firemarkers were given (simulated) missions. Their actual delivery of the requested fire was closely monitored until they demonstrated they could deliver rounds accurately and in a timely manner.

OPFOR. The OPFOR was given 2 weeks of scenario-specific training prior to the start of the first pretraining test. The purpose of this training was to insure that the OPFOR executed its mission in a tactically proficient and standardized manner.

Test Design

Schedule. The field experiment consisted of four phases of tactical training and performance testing, replicated in two cycles. Each cycle consisted of the testing and training of four test units during a 3-week period (Figure 1).

Phase I, pretraining tests, was carried out over 4 days; one unit was tested each day. The other three units performed maintenance or other duties. Phase II, tactical training, occurred over a 5-day period, and all tested units participated each day. Phase III, post-training tests, had the same schedule as Phase I. Phase IV, shoot-offs, was carried out over a 2-day period with two exercises per day. Each unit was scheduled to participate in two shoot-off exercises, one on each of the 2 days.

Description of Phases. Phases I and III, the pretraining and posttraining tests, were ARTEP-based tactical performance tests. Phase I tests established entry-level tactical proficiency, and Phase III tests established performance gains and final performance levels.

Tests consisted of a movement-to-contact/attack followed by a defense. In the general design of the test, the tested units were permitted free play, constrained only by the tactically realistic orders given by their simulated company team commander (the senior tactical controller).

The scenario for the OPFOR was carefully constructed to provide standardized measurement and observation opportunities without compromising tactical realism. Two test lanes were used, and each unit was administered the pretraining test on one lane and the posttraining test on the other. The order of lane use in pretests and posttests was counterbalanced to minimize any possible lane effects. The terrain on these test lanes was quite similar. See Appendix I for a detailed description of the terrain.

Week Day	1					2					3				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Activity	Pretraining tests					Tactical training					Posttraining tests				
Tactical exercises	1 attack & 1 defense per day					Determined by trainer					1 attack & 1 defense per day				
Shoot-off exercises											2 meeting engagements per day				

Figure 1. Schedule for one cycle of testing and training.

Upon completion of Phase I testing, units were assigned to either REALTRAIN or conventional training primarily on the basis of casualties inflicted and sustained during pretests. Assignments were made so that training groups, as much as possible, had equivalent tactical proficiency before training began. (The assignment procedures are contained in Appendix G.)

Phase II consisted of a 5-day training period during which units received either REALTRAIN training or conventional training. Conventional training was defined in terms of the absence of current engagement simulation techniques. Casualties could be declared by the trainer or umpires on the basis of criteria such as undue exposure of tactical vehicles, force ratios, etc. In addition, no umpire was allowed to act in a capacity similar to that of a REALTRAIN controller. Indirect fire was controlled through the trainer, training NCO, or an umpire; no FDC was employed.

Training was administered by two highly experienced and accomplished armor officers; one trained the units with REALTRAIN, and the other used conventional training methods. Both trainers were given the same training guidance, based on ARTEPs relevant to the missions and test unit composition (Appendix H). Each prepared a 5-day POI. Each POI was reviewed and discussed with the trainer to insure that the POIs were comparable and that both trainers were training on the same missions, tasks, and conditions.

Conduct of training was monitored to insure that the POIs were followed. However, as long as the trainers stayed within the generally broad limits of the approved POI, they were allowed to adjust their training to meet the particular needs of the units they were training.

The same materiel training resources, terrain, and personnel, with the exception of REALTRAIN controllers and equipment, were available to both trainers. Controllers are required for casualty assessment in a REALTRAIN exercise but are not required in conventional training exercises. However, the conventional trainer was provided with a number of umpires to assist in conventional casualty assessment.

Phase IV consisted of tactical exercises in which REALTRAIN and conventionally trained units opposed one another in free-play meeting engagements. In each cycle, each unit was scheduled to participate in two exercises, opposing each of the units in the other training group.

Two test lanes were used. For a test lane, each unit was independently given a written order (Appendix C) from its simulated company team commander to insure that a meeting engagement between the two units would take place. Test units participated in one exercise on each of the two lanes. Order of use of the lanes and direction of

movement on the lane were counterbalanced for REALTRAIN and conventional units to overcome any potential biasing effects due to terrain characteristics. Once contact had been made, engagements continued until all tanks on one side had been destroyed.

Tactical Test

Attack. In the Phase I and III attack modules, the tested unit was given a specific terrain area as its objective. The unit's mission was to clear the objective of all enemy forces. (See Appendix A for operations orders.)

The tank platoon leader was told that enemy activity had been observed in the vicinity of the objective and in a specific area of the terrain forward of the objective. In fact, the forward location was occupied by the OPFOR TOW section, and the objective itself was occupied by two tanks led by the OPFOR platoon leader.

The positions of the OPFOR permitted use of largely covered and concealed routes of approach by the tested unit during much of the attack if the units showed good terrain appreciation. The OPFOR TOWs were part of a defense in depth, and the tested unit had to destroy the TOWs or force them to withdraw in order to press successfully the attack on the objective itself.

During the tested units' initial movement-to-contact, only the TOWs were in position to engage elements of the tested unit. The rules of engagement for the test scenario required the TOWs to withdraw when test unit tanks closed to within 400 m of their position. (See Appendix B for test operating procedures.)

The scenario for the OPFOR light tank section on the objective required the two tanks to engage the tested unit as soon as possible and to remain on the objective until at least one OPFOR tank had been destroyed and tanks from the tested unit had closed to within 400 m.

Defense. For the defense modules, the mission of the test unit was to prevent OPFOR occupation of critical terrain for 1 hour to prevent interdiction of a road to be traversed within the hour by a hypothetical friendly convoy. (See Appendix A for operations orders.) The test unit was given its mission and allowed 40 minutes to compose and deliver orders and to consolidate and prepare its defense against the expected counterattack.

The scenario for the OPFOR prevented their moving or engaging the test unit at that time, but it did permit them to obtain tactical information from their designated surveillance positions. The OPFOR in the counterattack consisted of a tank platoon, TOW section, and FO section.

In the standardized counterattack scenario, the OPFOR TOWs provided overwatch while the light section and heavy section attacked along two likely avenues of approach. The exercise was terminated when either the first OPFOR tank occupied the key terrain objective from which it could interdict the road or 60 minutes after initiation of the counterattack.

In Phases I and III, decisions regarding aborted or interrupted trials (Appendix F) and regarding deviations from the scenario or operating procedures were made jointly by the senior tactical controllers and the civilian scientists.

Casualty Assessment Procedures. Casualties could be produced by (a) the tank main gun (105mm cannon), (b) the TOW heavy antitank weapon system, and (c) indirect fire (155mm artillery). (See Appendix D for casualty assessment rules and procedures.)

Data Collection

General. A wide range of data was collected during the course of the experiment. (Data forms are provided in Appendix E.) Data collection responsibilities are discussed briefly below. In addition to the performance data collection, scientific staff members maintained logs on any deviation from prescribed procedures and on any unusual factors that might have affected performance or data interpretation.

Tactical Vehicle Controllers. Controller/data collectors on tested unit and OPFOR vehicles collected information on critical aspects of performance, including use of overwatch, detections, firing events, use of dismounted TOWs, etc. All data were time indexed for comparison with data collected from other sources.

Mappers. Mappers collected time-indexed location and movement data and prepared map traces of all tactical vehicle routes. They noted times of halts, starts, and major firing events on their maps.

REALTRAIN Net Control Station. The NCS operators collected engagement and casualty data. NCS personnel were also responsible for tape-recording and providing short written summaries of tactical communications among both tested units and the OPFOR. In addition, NCS staff kept a detailed time-indexed log of all scenario-related events. The NCS transmitted times periodically to insure that the various data sources worked from a common time base.

Indirect Fire. Data on indirect fire were collected by the FO data collectors/controllers, FDC personnel, the REALTRAIN NCS, and a civilian scientist. The FO data collector provided information on detections made by the FO, on communications between FO and other members of the FO's unit, on the FO's location and movement, and on

the locations of preplotted targets. The FDC personnel recorded all information on the indirect fire missions called by tested units and the OPFOR. The NCS provided information on casualties resulting from indirect fire missions. The civilian scientist collected data on tested unit indirect fire planning.

Narratives. Upon completion of an exercise, the senior controller, OPFOR controller, and principal scientific staff prepared an exercise narrative. Narratives included a detailed reconstruction of events in the exercise and description of aspects of performance that might not have been recorded on the various data forms. These narrative sessions were tape-recorded for subsequent transcription and editing. (A typical narrative is included in Appendix J.)

Ammunition

Direct Fire. Prior to experimental trials, all tanks were equipped with Hoffman devices for simulating the tank main gun weapon signature. Because TOW backblast simulators were in short supply, most trials were executed using handgrenade simulators to simulate the TOW signature. These proved adequate and could be seen clearly from a considerable distance.

For all testing phases, tested units and OPFOR were issued nine Hoffman rounds per tank and eight simulators per TOW. This allotment proved sufficient to execute test phases without the need for ammunition resupply between exercises.

Indirect Fire. During pretests and posttests, the tested unit platoon leader was informed in his operations order that he would be supported by 155mm artillery. Indirect fire high explosive (HE) rounds were simulated by groundburst simulators. The tested unit platoon leader's ammunition supply rate (ASR) was 49 HE rounds and five smoke missions (at two smoke pots per mission).

These resources were to be used as needed over the course of both attack and defense missions. Thus, if a unit expended its 49 HE rounds during an attack, none would remain for the defense. In practice this never occurred, and all tested units had sufficient HE rounds remaining at the end of the attack to employ indirect fire during the defense. The OPFOR's ASR was 28 HE rounds and three smoke missions.

During the Phase IV shoot-offs, each tested unit had an ASR of 21 HE rounds and three smoke missions. During Phase III (training) each trainer was allotted 300 HE rounds and 120 smoke pots per cycle to use as he judged best over the 5-day training period. Trainers indicated that this allotment was sufficient.

RESULTS

General

The results presented here are oriented primarily toward product measures of performance supported by selected processes measures. Findings are presented in five major sections: mission accomplishment, casualties, use of cover and concealment, observation, and overall performance.

Mission Accomplishment

Mission accomplishment is the prime goal of any combat unit. It is defined here as securing terrain specified as critical in the tested units' operations orders. In the attack, tested units were required to occupy and clear their objective. This involved destroying or forcing withdrawal of the OPFOR. In the defense, tested units were required to prevent the OPFOR from occupying a designated position. Finally, in the shoot-off meeting engagements, a tested unit was considered to have accomplished its mission if it destroyed or neutralized the opposing tested unit. Further details are presented in the methods section and in operations orders. (See Appendixes A and C.)

Table 1 presents the number of attack missions successfully accomplished by REALTRAIN and conventionally trained units during pre-training and posttraining tests. During pretests, one REALTRAIN unit and one conventional unit succeeded in the attack. Following training, REALTRAIN units succeeded in three attacks, and conventional units did not accomplish any attack missions. Thus, REALTRAIN units improved; conventional units did not.

Table 1

Mission Accomplishment: Attack

Test	Training group	
	REALTRAIN	Conventional
Pretest	1	1
Posttest	3	0

Table 2 presents the number of defense missions accomplished by REALTRAIN and by conventionally trained units. During pretests, REALTRAIN units succeeded in one defense mission; conventional units did not succeed in any. Following training, REALTRAIN units succeeded in two defenses; conventionally trained units, in one defense. Thus, both training groups improved.

Table 2

Mission Accomplishment: Defense

Test	Training group	
	REALTRAIN	Conventional
Pretest	1	0
Posttest	2	1

During the seven¹ shoot-off exercises in which REALTRAIN and conventional units opposed each other in meeting engagements, REALTRAIN units were superior to conventionally trained units. REALTRAIN units won six of the meeting engagements, and conventional units won one. Table 3 shows the mission accomplishment results of all three types of missions. Generally, both REALTRAIN and conventional units performed poorly in pretraining tests. Following training, however, REALTRAIN units performed better than conventionally trained units. Overall, REALTRAIN units were successful in 73% of their missions after training; conventional units, in only 13%. Because of the small number of units tested, it is important to note the consistency of the mission accomplishment results. Moreover, in the shoot-off exercises, REALTRAIN units convincingly showed their superiority over the conventionally trained units.

In general, the overall level of mission accomplishment was not as high as had been expected. Pilot testing had shown that with good leadership and skilled unit performance both attack and defense missions could be accomplished. However, given the low entry-level proficiency of the units and the complexity of controlling and coordinating the activities of a tank platoon, a TOW section, and a forward observer, military observers felt that a few more days of training would have been required to produce skilled, integrated units. (This

¹One of the eight scheduled shoot-off trials was cancelled due to inclement weather and insufficient visibility.

topic will be examined in later reports.) However, subsequent sections of the present report will show that REALTRAIN and conventional units improved substantially on a number of tactical performance measures in addition to mission accomplishment.

Table 3

Percentages of Overall Mission Accomplishment: Attacks, Defenses, and Meeting Engagements (Shoot-Offs)

Test	Training group	
	REALTRAIN	Conventional
Before training	25 (N = 8)	13 (N = 8)
After training	73 (N = 15)	13 (N = 15)

Casualties

Attack. The numbers of casualties sustained are critical measures of a unit's effectiveness and its ability to continue to function effectively. Table 4 presents the percentage of tank and TOW casualties sustained by tested units in the attack. During pretraining tests, both REALTRAIN and conventional units suffered devastating losses; 86% and 82%, respectively, of their tanks and TOWs were declared casualties.

Table 4

Percentage of Tested Unit Tanks and TOWs
Declared Casualties in the Attack

Test	Training group	
	REALTRAIN	Conventional
Pretest	86	82
Posttest	63	75

Following 5 days of training, REALTRAIN units decreased casualties sustained by 23%; conventional units, by 7%. Thus, although both units improved, the percentage of decrease in casualties sustained by REALTRAIN units was more than three times the percentage of decrease for conventionally trained units.

Early Casualties. It will be realized that in the attack the OPFOR TOW section occupied a position forward of the objective area as part of a defense in depth. The scenario called for these TOWs to inflict as many casualties as possible and then to withdraw when elements of the tested unit closed on the TOW position. The percentage of tested units' tanks and TOWs killed by the OPFOR before the first TOW was forced to withdraw is an indication of how well the tested units conducted the initial phase of the attack. During the pretest, about two-thirds of all tested units' weapons systems were destroyed before the OPFOR TOWs withdrew (Table 5).

Table 5

Percentage of Tested Unit Tanks and TOWs
Declared Casualties Prior to OPFOR TOW
Withdrawal (Attack)

Test	Training group	
	REALTRAIN	Conventional
Pretest	61	68
Posttest	22	54

In the posttest, the REALTRAIN unit improved substantially (22% casualties); the conventional units showed less improvement (54% casualties). Thus, these data indicate that after training, conventionally trained units were more likely to be rendered ineffective early in the engagement than were REALTRAIN units. The REALTRAIN units, however, were more likely to survive the early stages of the engagement with sufficient forces to enable them to press their attack effectively.

Early Tank Casualties. The ability of a tested unit to continue an attack effectively depends partly on the total number of weapons systems available. Perhaps more important, however, is the number of surviving tanks, because the lightly armored TOWs cannot continue to attack unsupported. Table 6 presents the percentage of tested tanks killed by OPFOR TOWs before OPFOR TOW withdrawal.

Table 6

Percentage of Tested Unit Tanks Declared Casualties
Prior to OPFOR TOW Withdrawal (Attack)

Test	Training group	
	REALTRAIN	Conventional
Pretest	65	70
Posttest	16	65

In the pretest the REALTRAIN units had, on the average, less than two surviving tanks when the TOWs withdrew. In the posttest they had suffered less than one tank casualty on the average and were therefore in good condition to press the attack on the objective.

The conventional units improved slightly. Seventy percent of the tanks were declared casualties prior to OPFOR TOW withdrawal in the pretest, and 65% were casualties in the posttest. Thus, both in terms of total weapon systems available and total heavy armor available, REALTRAIN units were better equipped than conventional units to continue their attack effectively when the OPFOR TOWs were withdrawn.

Early Leader Casualties. Sound command and control are a critical aspect of any military operation. Frequently, when leaders are lost units cease to function in an integrated fashion and become more vulnerable. Table 7 shows the percentage of tested unit leaders (tank platoon leaders and platoon sergeants) killed before the first OPFOR TOW withdrew. The results are consistent with the previous data. In the pretest, 75% of REALTRAIN leaders were killed before TOW withdrawal; 63% of conventional leaders were killed. Following training, only 13% of the REALTRAIN units' leaders had been declared casualties, compared to 63% of the conventional units' leaders. Thus, the results are consistent in indicating that in terms of both firepower and leadership, REALTRAIN units were better disposed to continue their attack successfully than were conventionally trained units.

OPFOR Casualties. The ability of a unit to inflict casualties on an opposing force is another critical measure of its performance. Table 8 shows the percentage of tank and TOW casualties inflicted on the OPFOR by the tested units in the attack. In the pretest, both REALTRAIN and conventional units inflicted relatively few casualties on the OPFOR. Following training, however, REALTRAIN units improved substantially, inflicting casualties on 44% of the OPFOR; conventional units did not improve appreciably. In these posttraining exercises, then, REALTRAIN units used their firepower more effectively than did conventionally trained units.

Table 7
Percentage of Platoon Leaders and Platoon Sergeants
Declared Casualties Prior to OPFOR
TOW Withdrawal (Attack)

Test	Training group	
	REALTRAIN	Conventional
Pretest	75	63
Posttest	13	63

Table 8
Percentage of OPFOR Tanks and TOWs Declared
Casualties in the Attack

Test	Training group	
	REALTRAIN	Conventional
Pretest	6	12
Posttest	44	6

Meeting Engagement Casualties. Data from shoot-off meeting engagements are fully consistent with data from the posttest attacks. Since REALTRAIN and conventional units opposed each other in these exercises, the casualties sustained by one training group were inflicted by the other. Thus, REALTRAIN units sustained 29% casualties and inflicted 71% casualties; the figures are reversed for conventional units. Again, REALTRAIN units' performance was superior to that of conventional units.

Casualties Exchanged. Table 9 presents summary casualty exchange ratios (CER) for the attacks and shoot-off exercises. The CER, which presents tank/TOW casualties inflicted and sustained in a single index, is equal to the number of casualties inflicted divided by the number of casualties sustained. Thus, the larger the CER, the more favorable the exchange ratio to the tested unit.

Table 9

Casualty Exchange Ratios (CER)^a for Attack and
Meeting Engagements (Shoot-Offs)

Test	Training group	
	REALTRAIN	Conventional
Pretest	0.04	0.09
Posttest	0.41	0.05
Shoot-off	2.5	0.4

^aCER is equal to the number of tank and TOW casualties inflicted by tested units divided by the number of casualties sustained.

The CER data show that during pretests, both training groups earned a most unfavorable CER. During posttests, the REALTRAIN units improved substantially, and conventional units did not change appreciably. During shoot-offs, both REALTRAIN and conventional units showed gains over posttests, and REALTRAIN units earned a favorable CER.

These data suggest that the pretraining and posttraining test attacks were very difficult for all tested units. In addition, these data support the military judgment, noted above, that all units could have benefited from additional training because neither REALTRAIN nor conventional units achieved a favorable CER in posttraining tests.

Defense. Following the attack, an administrative halt was called to resupply and reconstitute the tested units to full strength. The units were then given their defensive mission and allowed 40 minutes to consolidate and prepare their defenses before the OPFOR launched their counterattack.

Tables 10 and 11 present, respectively, the percentages of casualties sustained and casualties inflicted in the defense. These data generally parallel those for the attack; during pretests, both training groups sustained devastating losses of approximately 90% of their tanks and TOWs. Following training, however, both REALTRAIN and conventional units reduced substantially the casualties sustained, with REALTRAIN units showing the greatest improvement. The percentage of casualties inflicted on the OPFOR did not change dramatically from pretest to posttest, although both training groups improved. Conventional units improved more (from 14% to 32% casualties inflicted) than did the REALTRAIN units (from 25% to 32%). In the posttraining test, both training groups inflicted an equal percentage of casualties.

Table 10

Percentage of Tested Unit Tanks and TOWs Declared
Casualties in the Defense

Test	Training group	
	REALTRAIN	Conventional
Pretest	89	89
Posttest	36	54

Table 11

Percentage of OPFOR Tanks and TOWs Declared
Casualties in the Defense

Test	Training group	
	REALTRAIN	Conventional
Pretest	25	14
Posttest	32	32

Table 12 presents the CERS for the defense. In the pretest, neither REALTRAIN nor conventional units achieved a favorable exchange ratio. In the posttest both REALTRAIN and conventional units improved markedly, but neither was able to achieve a favorable exchange ratio. These data further support the observation that both groups could have benefited greatly from more than the 5 days of training received in this experiment. It is also clear that the defense test module was quite difficult for the tested units.

Use of Cover and Concealment

General. Previous sections have shown that during pretraining tests all units performed poorly in terms of mission accomplishment and in terms of casualties inflicted and sustained. Moreover, although tested units' performances improved after training, neither REALTRAIN nor conventional units achieved favorable exchange ratios in posttraining tests. Informal observation and test narrative data suggested

that test units, especially during pretraining tests, often exposed themselves unnecessarily and were generally careless about their use of cover and concealment.

Table 12
Casualty Exchange Ratios (CER)^a for the Defense

Test	Training group	
	REALTRAIN	Conventional
Pretest	0.28	0.16
Posttest	0.90	0.60

^aCER is equal to the number of tank and TOW casualties inflicted by tested units divided by the number of casualties sustained.

Table 13 presents the frequencies of detections and identifications of the tested units by the OPFOR. These data show that overall the frequency of pretest detections of REALTRAIN and conventional units was quite similar, about 18 detections per exercise. REALTRAIN units tended to be detected more frequently during attacks, and conventional units tended to be detected more often during defenses. During posttests both training groups improved, with REALTRAIN units showing the greatest overall improvement.

Attack. The attack module of the test provided ample opportunity for tested units to display their mastery of proper employment of cover and concealment while traversing the approximately 3 km from the attack position to their objective. Exploratory trials conducted before the beginning of experimental trials showed that, with sufficient care, it was possible to approach test lane objectives without being detected frequently.

The detection data from the attack (Table 13) suggest that use of cover and concealment during the pretest was poor. During posttraining tests, however, detections of REALTRAIN units were reduced by 59%; detections of conventional units increased. These findings help to explain the casualty data (Table 5) that indicate that the REALTRAIN units tended to be rendered ineffective relatively early during pretest exercises but not during posttests.

Table 13

Number of Times Tested Unit Elements Were Detected and Identified by the OPFOR

Test phase	Mission			
	Attack		Defense	
	REALTRAIN	Conventional	REALTRAIN	Conventional
Pretest	64	42	73	100
Posttest	26	52	30	73
			137	142
			56	125

Thus, after training, REALTRAIN units had improved their ability to use cover and concealment properly to a greater extent than conventional units had, thereby providing the OPFOR fewer opportunities to detect and engage. REALTRAIN, then, can provide an excellent vehicle for teaching the importance of careful tactical movement and of selecting covered or concealed firing positions.

Defense. During the consolidation phase of the defense, the OPFOR were permitted to observe the tested units move into their defensive positions, but were prohibited from initiating an engagement. As in the attack, exploratory testing had indicated that it was possible for the tested units to occupy sound defensive positions without unduly exposing their locations.

Table 14, which presents a breakdown of the detections of tested units during the defense, shows a generally high detection rate during both phases of the defense. In the pretests, REALTRAIN and conventional units were detected frequently during both consolidation and execution phases. Although both groups improved in posttraining tests, the REALTRAIN units' improvement was the greatest and most consistent. Conventional units improved greatly from pretest to posttest in the consolidation phase, but did not improve appreciably in the execution phase.

These detection data provide a partial explanation of the defense casualty data presented earlier. In the pretests, the OPFOR frequently detected tested units moving into defensive positions and therefore were able to engage them more easily when the OPFOR counterattack began. Moreover, as detection frequencies were also high during the execution, the OPFOR did not lack targets to engage.

During posttests, the nearly 60% reduction in detections of REALTRAIN units' tanks and TOWs was associated with a 60% reduction in casualties sustained, and the 27% reduction of detections of conventional tanks and TOWs was associated with a 40% reduction in casualties sustained. Thus, the data from the attack and from the defense indicate that poor use of cover and concealment was probably a major factor in the tested units' failure to accomplish their missions during pretests and for the conventional units' failure during posttests.

The differences in the detection data were not due to a few extreme cases. Units were ranked with respect to the number of times tanks/TOWs from a unit were sighted by the OPFOR (data combined across both missions). The rank of one was assigned to the unit which had been observed by the OPFOR the most frequently, and the rank of eight was assigned to the unit which had been observed least frequently.

Figure 2 presents the mean rankings for each training group as a function of pretest and posttest. The groups were similar in the pretest, but REALTRAIN units were superior after training. Thus, the superiority in use of cover and concealment, reflected by the decreased

Table 14

Number of Times Tested Unit Elements Were Detected and Identified by the OPFOR
During Consolidation and Execution Phases of the Defense

Test phase	Phase of defense					
	Consolidation		Execution		Overall defense	
	REALTRAIN	Conventional	REALTRAIN	Conventional	REALTRAIN	Conventional
Pretest	33	56	40	44	73	100
Posttest	10	28	20	45	30	73

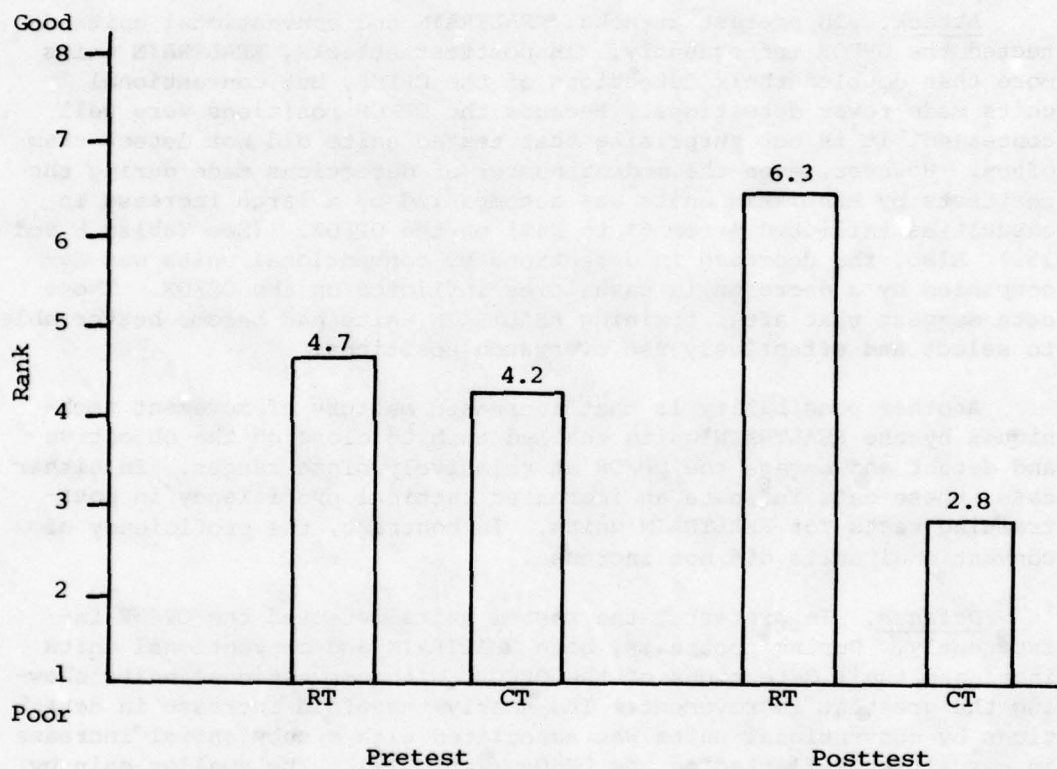


Figure 2. Mean rankings of tested units based on frequency of detection and identification of test unit elements by OPFOR.

frequency of detections, was due to a general improvement in the REALTRAIN units rather than to an exceptionally good or poor performance by one or two units.

Observation

General. As detections of tested unit vehicles by the OPFOR are indicators of use of cover/concealment, so detections of the OPFOR by tested units are indicators of the tested units' alertness and their ability to select and use good overwatch positions. Table 15 presents the frequency with which the OPFOR tanks and TOWs were detected by tested units.

Attack. In pretest attacks, REALTRAIN and conventional units detected the OPFOR infrequently. In posttest attacks, REALTRAIN units more than doubled their detections of the OPFOR, but conventional units made fewer detections. Because the OPFOR positions were well concealed, it is not surprising that tested units did not detect them often. However, even the modest number of detections made during the posttests by REALTRAIN units was accompanied by a large increase in casualties inflicted (from 6% to 44%) on the OPFOR. (See Tables 8 and 15.) Also, the decrease in detections by conventional units was accompanied by a decrease in casualties inflicted on the OPFOR. These data suggest that after training REALTRAIN units had become better able to select and effectively use overwatch positions.

Another possibility is that increased mastery of movement techniques by the REALTRAIN units enabled them to close on the objective and detect and engage the OPFOR at relatively close ranges. In either case, these data indicate an increased tactical proficiency in post-training tests for REALTRAIN units. In contrast, the proficiency of conventional units did not increase.

Defense. In pretests, the tested units detected the OPFOR infrequently. During posttests, both REALTRAIN and conventional units increased their detections of the OPFOR, with conventional units showing the greatest improvement. The nearly threefold increase in detections by conventional units was associated with a substantial increase in casualties inflicted on the OPFOR (Table 11). The smaller gain by REALTRAIN units was associated with a smaller increment in casualties inflicted. These detection data are fully consistent with casualty data presented earlier. The data suggest that, after training, tested units from both training groups were better able to select and to use effectively sound defensive positions that permitted observation and engagement of the counterattacking OPFOR.

Number of Times OPFOR Elements Were Detected and Identified by the Tested Unit

Test Phase	Mission					
	Attack		Defense		Overall	
	REALTRAIN	Conventional	REALTRAIN	Conventional	REALTRAIN	Conventional
Pretest	7	12	12	12	19	24
Posttest	18	5	22	31	40	36

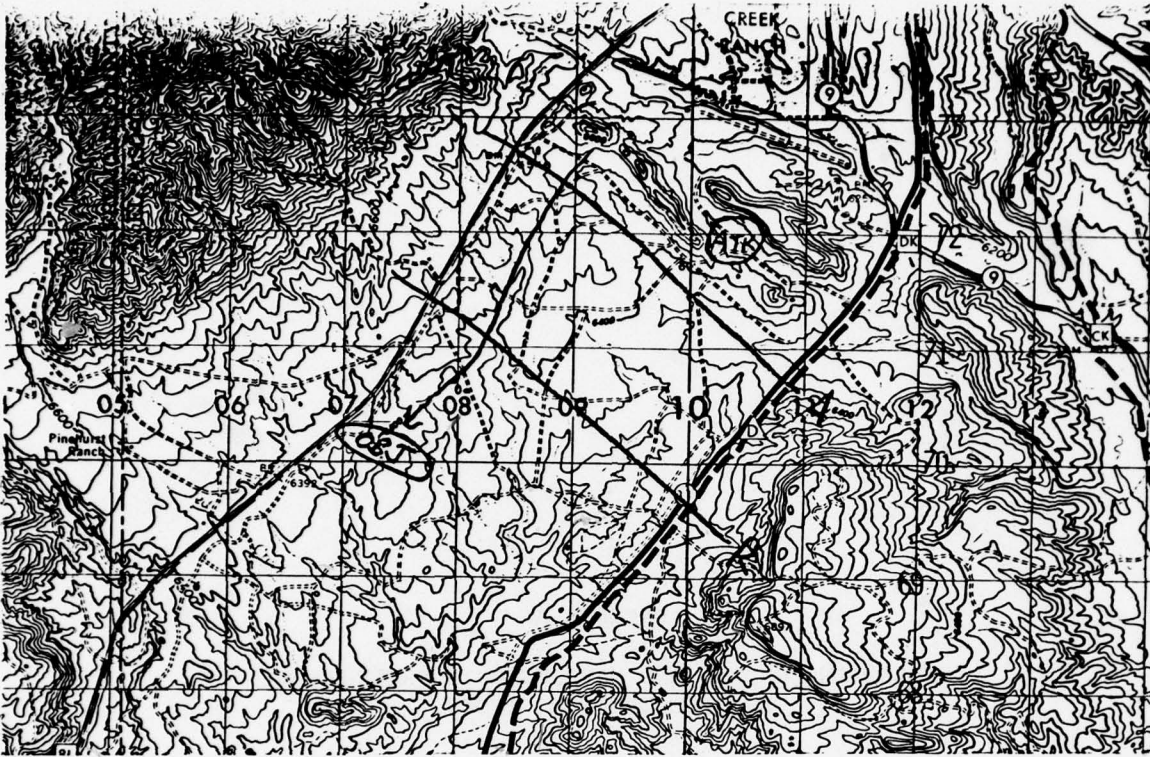
Overall Performance

The preceding sections have compared REALTRAIN and conventionally trained units on a number of performance measures. Performance in pretraining tests was poor. In posttraining tests, both groups generally showed some improvement. To determine the scope of improvement, tested units were scored on whether or not each showed improvement from pretest to posttest on the five measures discussed above. These measures of performance consisted of mission accomplishment, casualties inflicted, casualties sustained, detections by tested units, and detections by the OPFOR. Tested units were scored on each measure for the attack and for the defense, a total of 10 measures. REALTRAIN units improved on an average of 7.8 of the 10 measures (median = 8), and conventional units improved on an average of only 4.0 measures (median = 3.5). Thus, REALTRAIN units improved on more measures than did conventionally trained units.

In addition, tested units were ranked in terms of their pretest and posttest performance on the same 10 measures. Pretest differences between REALTRAIN and conventional units were not significant. In posttests, however, REALTRAIN units (median = 6.5) were ranked significantly higher than conventional units (median 3.0; $p = .057$, Mann-Whitney U Test). This finding is supported by the results of the shoot-off meeting engagements presented above. REALTRAIN units won six of the seven engagements and sustained fewer and inflicted more casualties than did conventionally trained units. Thus, REALTRAIN units not only improved on more critical performances than did conventionally trained units, but also performed significantly better following training. The results presented in this report indicate that REALTRAIN can be extremely effective for the training of Armor/Anti-Armor units.

APPENDIX A

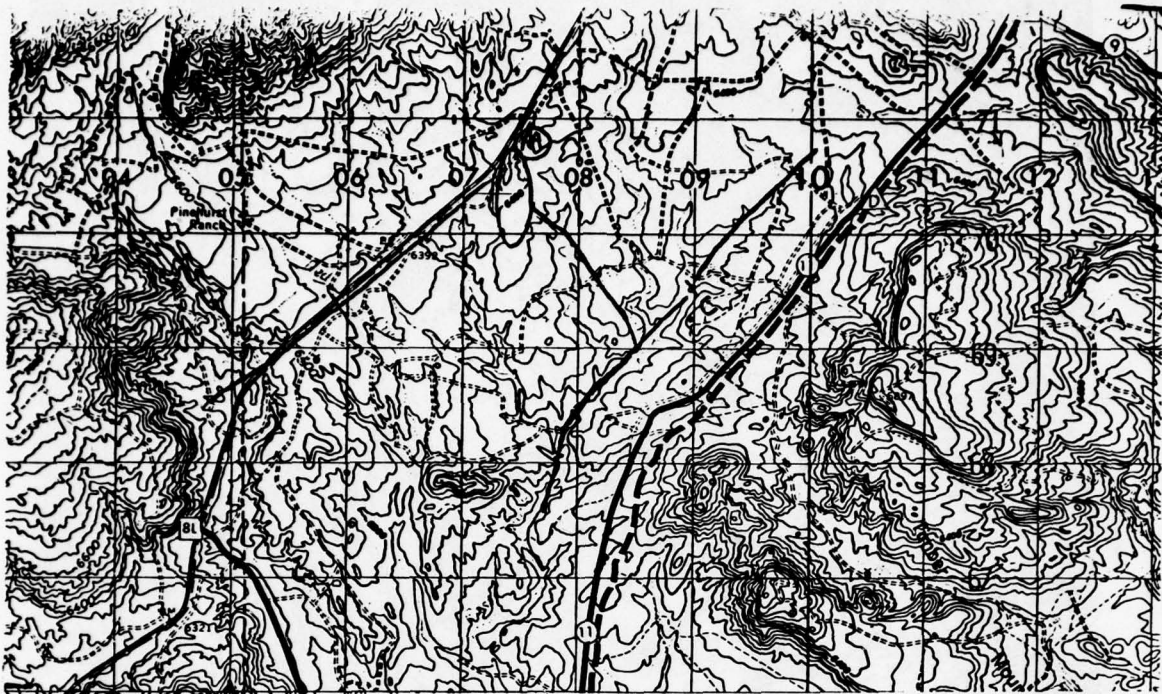
OPERATIONS ORDERS AND MAPS USED IN PRETRAINING AND POSTTRAINING TESTS



CTC OPORD - PHASE I & III - NORTH TO SOUTH LANE

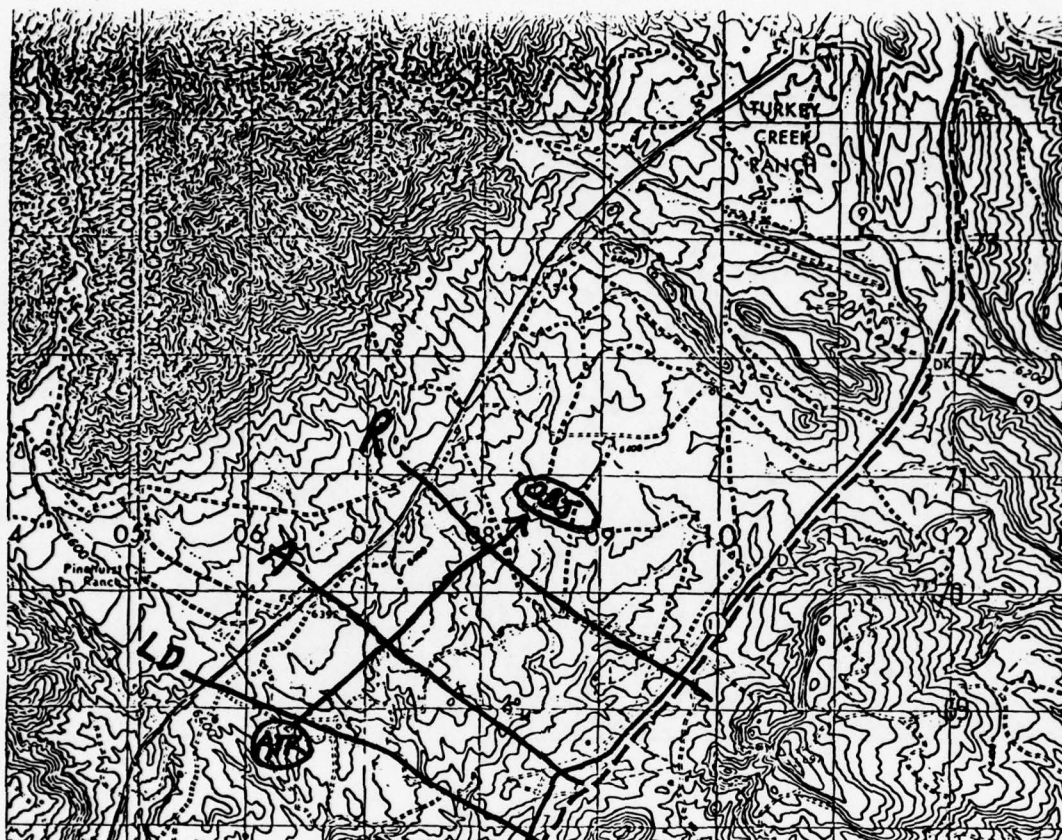
"OPFOR tanks and ATMs have been observed in the vicinity of the high ground at 07407040 and 07857079. At 0615 hours, one medium tank was confirmed as being in position at 07407000. No dismounted troops have been observed. Enemy force estimated to be one tank platoon, reinforced with ATM's. The TOW Section will remain attached to your platoon, one 155 Battalion is in DS of our Battalion TF, you will have one FO Section accompany you. No other organic support is available to you for this mission. You will use your present location (09407300) as your Attack Position. This position is secured by friendly infantry. Your LD is the crest of the ridge running SE from 09207290. You will attack NLT H-Hour along the route, 08907310, 08707265, 08407160, 08407100 and seize and secure the high ground at 07407020. See Map. You must traverse the designated route with at least one tank section. After you clear the objective you will consolidate your elements to secure the high ground in that vicinity to deny its use to OPFOR. I will designate specific terrain for you to defend in that area to deny the OPFOR positions which overlook Hwy 11. I want you to get on the objective soonest; I will not be able to provide you any help except limited artillery fires.* You may use overwatch positions located on the LD if you wish. Report your arrival at, and passage of, all Phase Lines shown. I will follow your route of advance with the company command group. Any questions? (Ask questions in clarification of your Senior Controller.) The time is now H-Hour minus 45 minutes."

* We have an ASR of 49 HE rounds and 28 smoke rounds.



CTC DEFENSE FRAG ORDER
North to South Lane

Recent observation reports indicate the enemy is preparing to counter attack in our sector. We know he is occupying observation posts on the high ground to our front. Our company team is consolidating on key terrain between Hwy 11 and 115 to secure these routes for the remainder of our task force. Your mission is to secure the high ground in the vicinity of 075700 and 074705 to deny OPFOR interdiction of Hwy 115. Charlie Company is responsible for security of Hwy 11. Do not position any of your elements in their sector of responsibility. Your right and left limit boundaries are indicated on the sketch map. You must secure this terrain for at least one hour in order for the task force to pass safely. You will have 20 minutes to occupy your defensive positions when I give you the signal to move out. We have not received a resupply of artillery ammunition so that you must support your defense with the rounds remaining from your original ASR. Do you have any questions?



CTC OPORD - PHASE I & III - SOUTH TO NORTH LANE

"OPFOR tanks and ATMs have been observed in the vicinity of the high ground at 08507100 and 08157030. At 0615 hours one medium tank was confirmed as being in position at 08407100. No dismounted troops have been observed. OPFOR is estimated to be 1 tank platoon reinforced with ATMs. The TOW and FO Sections will remain attached to you, one 155 Battalion is in DS of our Battalion TF. No other organic support is available to you for this mission. You will use your present location (064688) as your Attack Position. This position is secured by friendly infantry. You will attack NLT H-Hour in the Direction-068684, 073700, and seize the high ground at 08507100. See Map. You must traverse the designated route with at least 1 tank section. After you clear the objective you will consolidate your elements to secure the high ground in that vicinity to deny its use to OPFOR. I will designate specific terrain for you to defend in that area to deny the OPFOR positions which overlook HWY 11. This terrain must be neutralized so as to secure the movement of the rest of our TF NW along HWY 11. Your LD runs generally along the road from 066680 along the forward edge of Hill 6465. The only help I can give you in case of contact is limited indirect fire support. We have an ASR of 49 rnds HE and 28 rnds SMOKE. You may occupy overwatch positions on the high ground to the rear of your LD if you choose. Report your arrival and departure from all Phase Lines. I will follow your route of advance. Any questions? (Ask of your Senior Controller). The time is now H-45 minutes."



CTC DEFENSE FRAG ORDER
South to North Lane

Recent observation reports indicate the enemy is preparing to counter attack in our sector. We know he is occupying observation posts on the high ground to our front. Our company team is consolidating on key terrain between Hwy 11 and 115 to secure these routes for the remainder of our task force. Your mission is to secure the high ground in the vicinity of 085708 and 087707 to deny OPFOR interdiction of Hwy 11 south of the high ground at 094693. Charlie Company is occupying positions along Hwy 11 vicinity of 089688. Do not position any of your elements in their sector of responsibility. Your right and left limit boundaries are indicated on the sketch map. You must secure this terrain for at least one hour in order for the task force to pass safely. You will have 20 minutes to occupy your defensive positions when I give you the signal to move out. We have not received a resupply of artillery ammunition so that you must support your defense with the rounds remaining from your original ASR. Do you have any questions?

APPENDIX B

TEST OPERATING PROCEDURES (TOP)

Test Operating Procedures and Rules of Engagement, North to South Lane

MISSION: ATTACK (Refer to Situation Map "A")

MAJOR TASKS: I. Planning and preparation for Mission - Initiating: CTC OPORD received by TU Leader

II. Movement to Contact

III. Conduct of Hasty Attack - Terminating: TU occupies objective or OPFOR retains objective.

MISSION ACCOMPLISHMENT CRITERIA: Objective is cleared of OPFOR.

Event and Test Operating Procedures	Rules of Engagement
<p>This TOP describes the conduct of a Phase I or III test (North to South Lane). The narrative begins when preparations conducted on the Ready Line are complete, and the test unit (TU) is ready to move to the Attack Position. NCS will provide standard time on the REALTRAIN Control Net; all controller timepieces will be synchronized.</p> <p>Event 1. Movement to initial positions (Administrative).</p> <p>a. When the TU is ready to move from the ECC to the Attack Position, the Senior Tactical Controller will notify the OPFOR Tactical Controller and, with the Senior Field Scientist, will lead the TU to Attack Position "N". Movement from the ECC to the Attack Position is administrative. The route of movement from the ECC parallels Route 11 to approximately 114714, taking the left (NW) turn, and following the unimproved road generally NW to the Attack Position in the vicinity of 103720. The Section Mappers for the light and heavy sections will follow the TU at the rear of the column. When the TU has moved out of sight of the</p>	
<p>1. TU will move out from ready line before the OPFOR does. OPFOR will not move out until TU has reached a position where they cannot observe OPFOR movement.</p> <p>2. OPFOR will be in position prior to the TU Platoon Leader's personal reconnaissance of the area.</p> <p>3. Movements of both forces to their initial tactical positions will be administrative. No fires of any kind are allowed.</p> <p>4. Once the TU PL has received the CTC OPORD, the TU is permitted to register IDF.</p> <p>5. During the attack mission, the TU will be opposed by OPFOR TOWs, artillery (FO) and Light Section tanks only.</p>	

MISSION: ATTACK (continued)

Event and Test Operating Procedures

Rules of Engagement

Tactical Controller will notify the OPFOR Controller that the OPFOR may move. The OPFOR Controller will order OPFOR to move to their predesignated positions.

b. The OPFOR TOWs deploy to their positions (MARIA) at 079708 and 080704; the light section tanks will move to (CINDY) 074698; the heavy section will move to a hide position in the vicinity of 073688. The OPFOR Tactical Controller, with the OPFOR Field Scientist, will verify the locations of OPFOR combat vehicles, to include that of any dismounted TOW. When checks have been completed, the OPFOR Controller will notify the Senior Tactical Controller. (See Map A)

c. Immediately after the departure of OPFOR, FDC will dispatch the Fire Markers to their initial positions. In the event that pre-planned fire requests have been called in, Fire Markers will be sent to positions to maximize coverage of the terrain. Location of Fire Markers is under the direction of the Senior Tactical Controller

MISSION: ATTACK (continued)

Event and Test Operating Procedures

Event 2. Reconnaissance and issuance of OPORDs by CTC and PL.
a. Upon notification that the OPFOR are in position, the Senior Tactical Controller will move with the TU Platoon Leader to a position overlooking the test lane (vicinity of 101719) and will hand the written CTC OPORD to the TU Leader. Following delivery of the CTC OPORD, the Senior Tactical Controller will inform NCS, FDC, and the OPFOR Controller of the time the order was delivered and the anticipated LD time. The OPFOR Controller will alert OPFOR elements.

b. The TU Platoon leader will formulate his plan and time in order. The Senior Field Scientist will notify the NCS of the time the PL's order is issued.

Rules of Engagement

1. The TU will be directed to cross the LD 45 minutes after the time of the Platoon Leader's receipt of the CTC OPORD.
2. No direct fires will be allowed until the Senior Tactical Controller reports that TU has crossed the LD.
3. Only smoke and registration missions by indirect fire are permitted until the TU has crossed the LD. In the event that indirect HE fire is called for before this time, FDC will acknowledge and record requests, informing the requestor that they cannot be fired due to higher priority engagements.

MISSION: ATTACK (Continued)

Event and Test Operating Procedures	Rules of Engagement
<p>Event 3. TU crosses the LD, moves to contact.</p>	<ol style="list-style-type: none"> 1. The TU Leader is free to select tank/TOW routes and firing positions so long as the route of advance designated in the CTC OPORD is traversed by at least one TU tank section. 2. Upon TU's crossing the LD, both sides are free to engage targets by both direct and indirect fires. 3. OPFOR will occupy the same OPs and initial positions for each test replication though both tanks and TOWs are free to adjust firing positions (assume alternate positions within 50 meters) once they have made contact with the TU.
<p>a. The TU departs the Attack Position and crosses the LD at H-Hour. The Senior Tactical Controller announces the crossing of the lead element over the Control Net. The OPFOR Controller will inform the OPFOR Platoon Leader over the OPFOR tactical net and will notify the OPFOR TOW Section and Lt Tank Section Controllers over the REALTRAIN Control Net.</p>	
<p>b. The Heavy Section Mapper follows the TU Platoon Leader's Section, the Light Section Mapper follows the Light Section, throughout the test to trace the movement of the sections. All such movement is tactical.</p>	

MISSION: ATTACK (continued)

Event and Test Operating Procedures

Rules of Engagement

Event 4. The TU responds to contact, develops the situation.

a. In this event, first contact may occur either through a firing event or through observation.

b. When the forward elements of the attacking TU reach the Forward TOW withdrawal lines (see Map A), the Senior Tactical Controller will report this to the OPFOR Tactical Controller. Upon receipt, the OPFOR Tactical Controller will order the OPFOR Platoon Leader to order the TOWs to displace to their counterattack support positions vicinity 065693 (Position DORIS).

c. As the TU continues to maneuver against the objective, the OPFOR Light Section will hold in place and continue to engage until two conditions are met: (1) the TU forward elements have reached the Light Tank Section withdrawal line (Map A), and (2) one of the OPFOR Light Section tanks has been declared a casualty. The Senior Tactical Controller will notify the OPFOR Tactical Controller when the TU forward elements have reached the Light Tank Section Withdrawal Line. When both conditions are met, the OPFOR Tactical Controller will, through the OPFOR Platoon Leader, order the withdrawal of the remaining OPFOR Light Section tank to its counterattack position in the vicinity of 070689 (Position BETTY). The remaining tank will displace tactically, leaving behind the tank which has been destroyed. (If both the OPFOR defending tanks have been assessed casualties, both will remain in place until the administrative break.)

1. Free maneuver will be used by the TU.
2. All casualties will follow REALTRAIN procedures and remain in place until ordered to relocate by either the Senior Tactical Controller or the OPFOR Tactical Controller.
3. Regardless of the tactical situation with respect to casualties, the OPFOR will withdraw on order from the TOW positions when the Senior Tactical Controller reports that the Tested Unit has crossed TOW withdrawal line. Such withdrawal will be conducted under cover of the overwatching Light Tank Section located on Objective "S". Previously selected routes of withdrawal will be used and both TOWs will withdraw to their counterattack position in the vicinity of 065693.
4. Both sides are free to engage at will by direct and indirect fire during Event 4.
5. No artillery fires will be placed upon the objective area following withdrawal of the Light Section tank.

MISSION: ATTACK (continued)

Rules of Engagement

Event and Test Operating Procedures

Event 4. (continued)

e. Upon withdrawal of one, or destruction of both, OPFOR Light Section tanks, the TU's final objective will have been left vacant. Upon occupation of the final objective by at least one TU vehicle or upon the OPFOR's destruction or neutralization of the TU threat, the Senior Tactical Controller will terminate the exercise.

MISSION: ATTACK (continued)

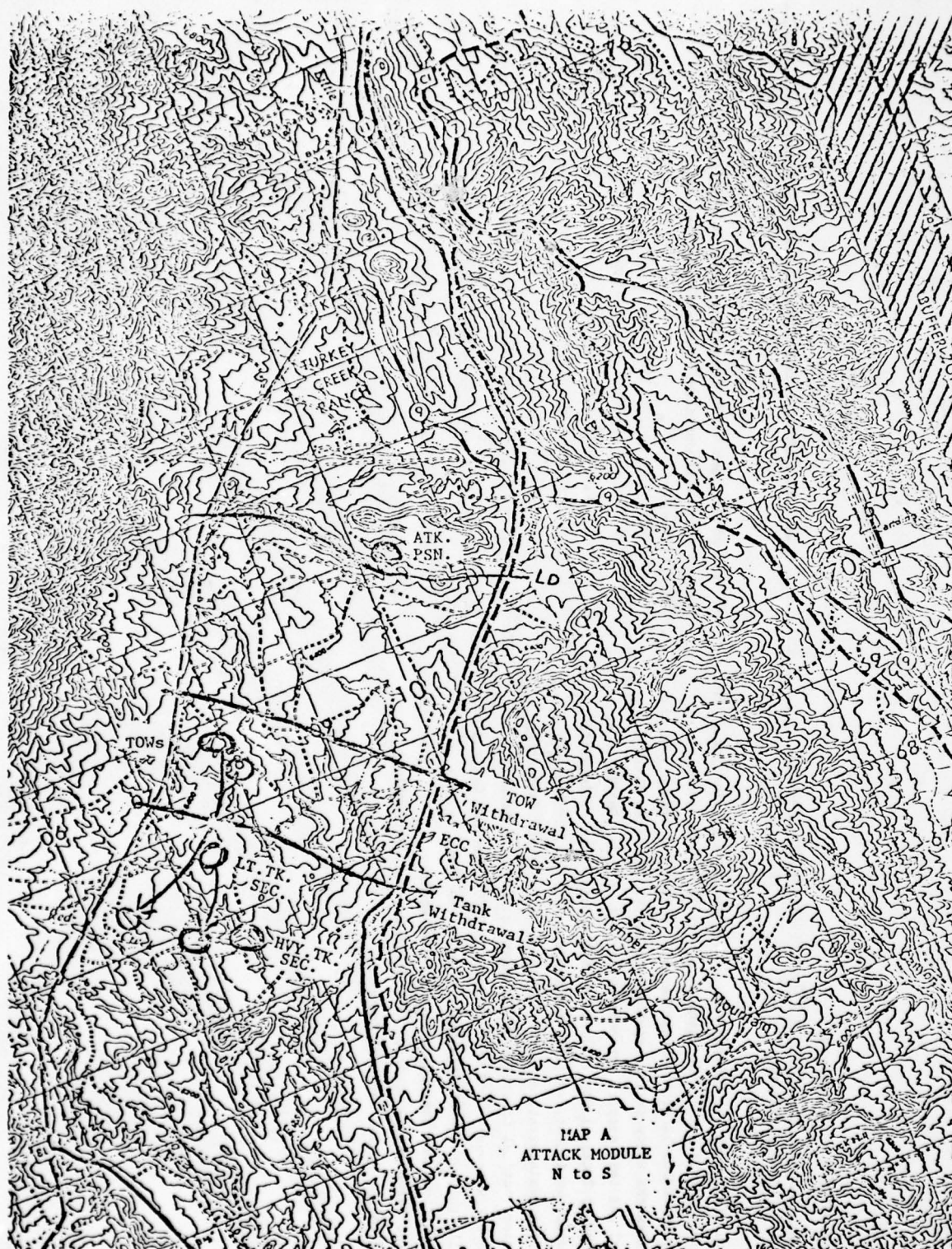
Event and Test Operating Procedures

Rules of Engagement

Event 5. Administrative Halt

a. Following the Senior Tactical Controller's termination of the exercise, he will direct the assembly of the TU in the vicinity of 076708; the OPFOR Tactical Controller will direct the assembly of the OPFOR less the Heavy Section vicinity of 072697 (Position ETHEL). Tactical and test support personnel will be informally debriefed at this time by Tactical Controllers and Field Scientists to identify procedural, equipment, vehicle, and support problems for resolution during the administrative halt. Following the informal debriefing, the Senior Tactical Controller will insure that the TU is unable to observe OPFOR movement and will inform the OPFOR Tactical Controller, who will, through the Platoon Leader, order the OPFOR to take up their positions for the counterattack (see Map B). After the OPFOR are in position, the OPFOR Tactical Controller reports to the Senior Tactical Controller.

a. Tested Unit and OPFOR casualties incurred during the attack mission will be reconstituted prior to the beginning of the Defense Mission.



Test Operating Procedures and Rules of
Engagement, North to South Lane

MISSION: DEFENSE (Refer to Situation Map B)

MAJOR TASKS:

- I. Planning and Preparation for Mission-Initiating: CTC OPORD received by TU Leader
- II. Organization of the Defense
- III. Defense against Counterattack-Terminating: OPFOR occupies objective or TU denies OPFOR the objective.

MISSION ACCOMPLISHMENT CRITERION: OPFOR is denied physical occupation on the objective area for one hour. Time commences at time of movement of the Counterattack Force.

Event and Test Operating Procedures	Rules of Engagement
Event 1. Reconnaissance and issuance of OPORDs by CTC and PL. a. Upon notification that the OPFOR are in position, the Senior Tactical Controller will move with the TU Platoon Leader to a position overlooking the position to be defended (vicinity of 073704) and will hand the written CTC OPORD to the TU Leader. Once the CTC OPORD is delivered, the TU Platoon Leader is permitted up to 20 minutes to prepare and deliver his order to the unit.	1. The OPFOR will be permitted to observe, but not fire upon, the TU for twenty minutes as it moves into its defensive positions <u>unless</u> the TU engages one OPFOR first. If the TU engages the OPFOR during Event 2, the OPFOR Tactical Controller will immediately execute Event 3.
Event 2. The TU organizes its defensive area. a. When the TU Platoon Leader has completed the delivery of the order to his unit, the Senior Tactical Controller will inform the TU Leader he has no more than 20 minutes to complete his organization of the defense. At this time, he will also inform the OPFOR Tactical Controller that the defense set-up has begun. The OPFOR Tactical Controller will order the OPFOR Platoon Leader to have his elements observe the objective and will order data collectors (over the REALTRAIN Control Net) to begin their data collection activities. b. The TU will assume its defensive positions.	2. The TU will be given no more than 20 minutes to organize for the defense once the Platoon Leader's order has been delivered.

MISSION: DEFENSE (continued)

Event and Test Operating Procedures

Rules of Engagement

Event 3. OPFOR Counterattacks

a. Twenty minutes after the beginning of TU's defense set-up, or immediately upon TU's engagement of OPFOR, whichever comes first, the OPFOR Tactical Controller will order the OPFOR PL to start the counterattack. He will immediately inform the Senior Tactical Controller and the controller/data collectors that the exercise has begun. The OPFOR Tactical Controller will monitor the OPFOR platoon net to ensure that the counterattack be conducted according to the following scenario: On the command "JACKIE ALFA" the Platoon Leader begins movement up the woodland on the south of the objective (Map B); at the same time, the remaining two tanks of the Heavy Section begin their movement in a northwesterly direction. When contact is made, delaying the movement of these elements (or no later than 30 minutes after "JACKIE ALFA"), the command "JACKIE BRAVO" is given and the light tank section begins to move up the woodland on the west of the objective. The TOWs will remain in place as a Base of Fire for the duration of the Defensive Mission.

b. The Senior Tactical Controller will terminate the Defense Phase when one of three conditions exist:

(1) TU has denied OPFOR occupation of the objective area for a period of 60 minutes after the OPFOR Tactical Controller issues counterattack order to OPFOR.

(2) OPFOR elements have occupied the objective within the 60 minute period.

(3) Either TU or OPFOR have lost all their TOWs and tanks.

1. The OPFOR Maneuver Force will counterattack immediately after the OPFOR Tactical Controller has declared the end of the 20 minute (or less) period allocated for the organization of the TU defense.
2. Both sides are free to engage targets by both direct and indirect fires during Event 3.

MISSION: DEFENSE (continued)

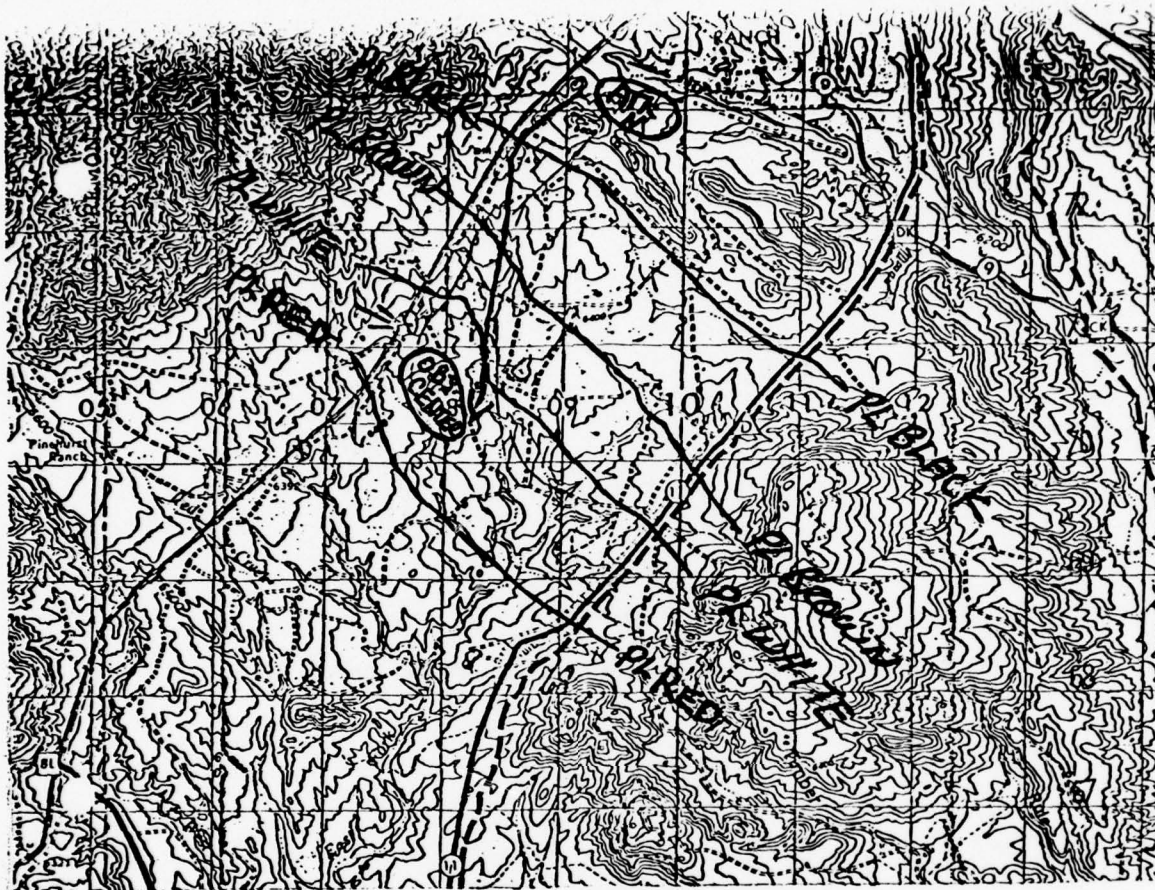
Rules of Engagement

Event and Test Operating Procedures

c. Upon completion of the exercise, the Senior Tactical Controller and the OPFOR Tactical Controller will assemble their units and cause them to be moved administratively to the ECC Ready Line. Both Tactical Controllers will report their areas clear to the REALTRAIN NCS.



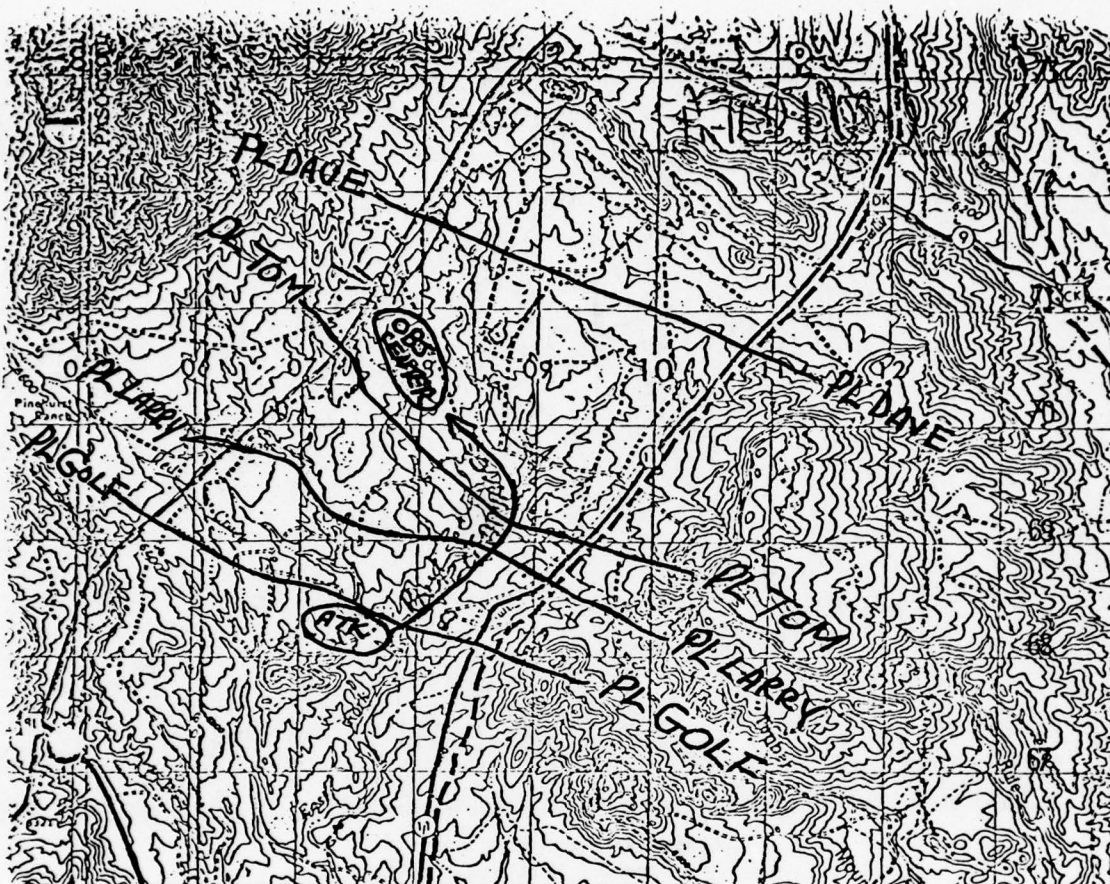
OPERATIONS ORDERS AND MAPS USED DURING SHOOT-OFFS



COMPANY TEAM COMMANDER OPORD
Phase IV - Lane 1 - Northern Test Unit

"Contact with the OPFOR has been lost. At last light yesterday, air OPs reported enemy tanks and ATMs operating in the vicinity of 06006800. No enemy activity has been observed north of Phase Line White. The FO and TOW sections remain attached to you. A 155 Battalion is in DS of our Battalion TF.* Our Company Team will provide the Advance Guard for our TF. The mission of the Battalion TF is to seize and secure FLORENCE, COLO (15 miles SW of Camp Red Devil). You are designated the point of the Advance Guard. You will move out at H-Hour from an Attack Position at your present location (09407300). Your route of advance is shown on the map. You must clear and traverse this route with at least 1 tank section. You may deviate from this route only as dictated by the enemy situation. Other routes selected by you must vector in on your assigned objective as shown on the map. You will seize and hold the key terrain at 08007050 and destroy any opposing force contacted. You will occupy this position until ordered to move on to the SW. When you report this intermediate objective secure and clear of the enemy, the rest of the TF will move. Report arrival and departure of all Phase Lines. Tank trails parallel to Highways 11 and 115 are off limits. I will follow along your route with the command group. Any questions? The time is H-Hour minus 45 minutes."

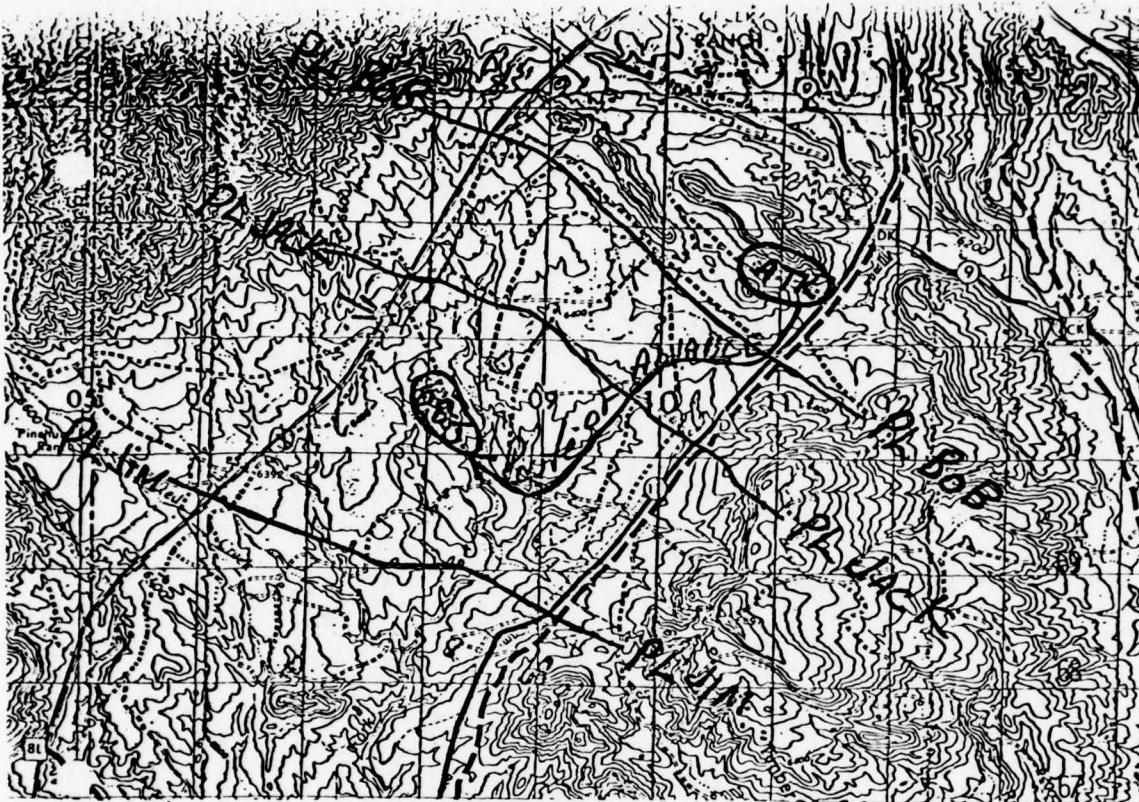
* We have an ASR of 21 rounds of HE and 3 smoke missions.



COMPANY TEAM COMMANDER OPORD
Phase IV - Lane 1 - Southern Test Unit

"Contact with the OPFOR has been lost. At last light yesterday air OPs reported enemy tanks and ATMs operating in the vicinity of 09007300. No enemy activity was reported south of Phase Line Dave. The TOW and FO Sections remain attached. One 155 Battalion is in DS of our Battalion TF.* Our Company Team will provide the Advance Guard for our TF. The mission of the TF is to seize and secure PETERSON FIELD, COLO (15 miles NE Fort Carson). You are designated the point of the Advance Guard. You will move out at H-Hour from an Attack Position at your present location (07406850). Your route of advance is as shown on the map. You must traverse and clear this route with at least 1 tank section. You will seize and hold the high ground at 08007050 and destroy any opposing force contacted. You will occupy this objective until ordered to move on to the NE. When you report your objective clear, the rest of the TF will move. Report your arrival and departure of all Phase Lines. Tank trails parallel to Highways 11 and 115 are off limits. I will follow your last element with the Company Team Command Group. The time is now H-Hour minus 45 Minutes. Any questions?"

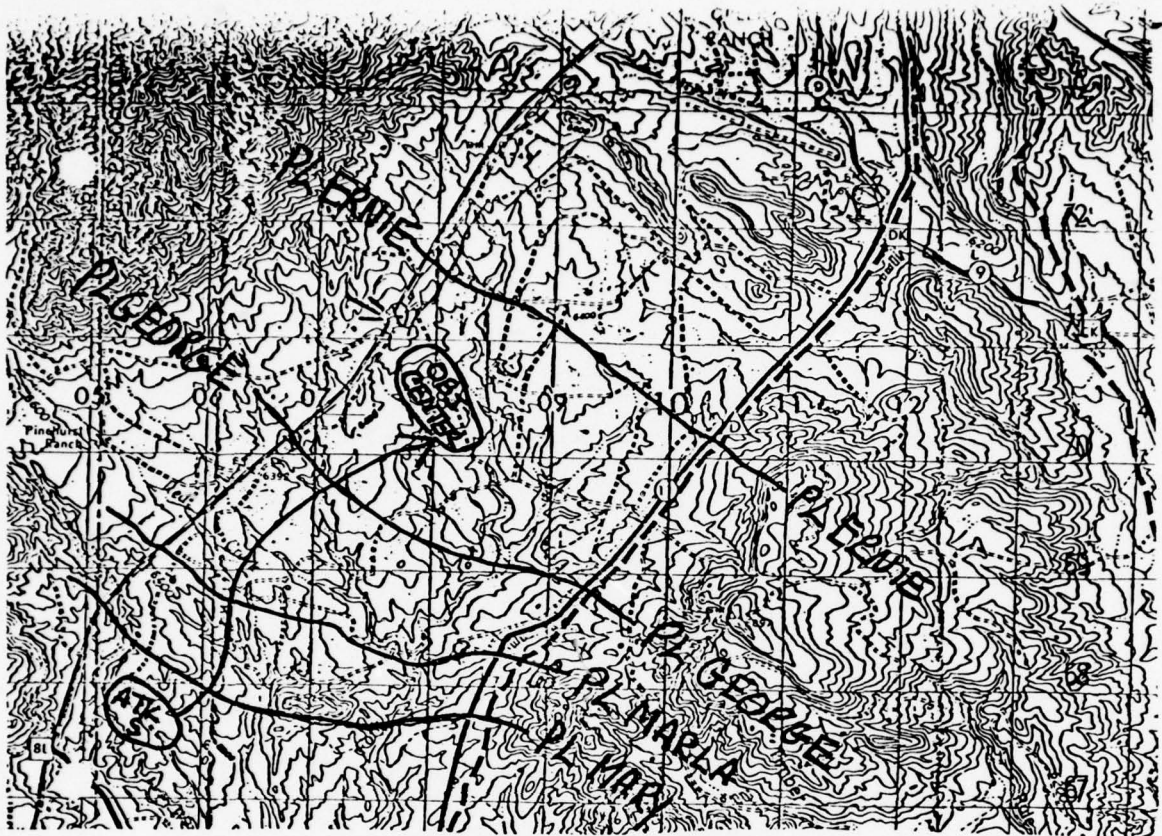
* We have an ASR of 21 rounds of HE and 3 smoke missions.



COMPANY TEAM COMMANDER OPORD
Phase IV - Lane 2 - Northern Test Unit

"Contact with the OPFOR has been lost. At last light yesterday air OPS reported enemy tanks and ATMs operating in the vicinity of 06006800. No enemy activity was reported north of Phase Line Jim. The FO and TOW Sections remain attached. One 155 Battalion is in DS of our Battalion TF.* Our Company Team will provide the Advance Guard for our TF. The mission of the TF is to seize and secure FLORENCE, COLO (15 miles SW of Camp Red Devil). You are designated the point of the Advance Guard. You will move out at H-Hour from an Attack Position at your present location (11357150). Your route of advance is as shown on the map. You must traverse this route with at least 1 tank section, and you may deviate from it only as dictated by the OPFOR situation. Any additional routes you select must vector on your assigned objective. You will seize and secure the high ground at 08207010, destroy all enemy contacted, and occupy this objective until ordered to move on to the SW. When you report your objective secure and clear of enemy, the rest of the TF will move. Report your arrival and departure of all Phase Lines. Tank trails parallel to Highways 11 and 115 are off limits. I will follow your last element along your route of advance. The time is now H-Hour minus 45 minutes."

*We have an ASR of 21 rounds of HE and 3 smoke missions.



COMPANY TEAM COMMANDER OPORD
Phase IV - Lane 2 - Southern Test Unit

61
"Contact with the OPFOR has been lost. At last light yesterday air OPs reported enemy tanks and ATMs operating in the vicinity of 09007300. No enemy contact was reported south of Phase Line Ernie. The FO and TOW Sections remain attached. One 155 Battalion is in DS of our Battalion TF.* Our Company Team will provide the Advanced Guard for our TF. The mission of the TF is to seize and secure PETERSON FIELD, COLO (15 miles NE Fort Carson). You are designated the point of the Advance Guard. You will move at H-Hour from an Attack Position at your present location (05406850). Your route of advance is as shown on the map. You must traverse and clear this route with at least 1 tank section, and you may deviate from this route only as dictated by the enemy situation. Any additional routes you select must vector on your assigned objective. You will seize and secure the high ground at 08207000 and hold it until ordered to move on to the NE. When you report your objective all secure and clear of enemy, the rest of the TF will move. Report arrival and departure at all Phase Lines. Tank trails parallel to Highways 11 and 115 are off limits. I will follow your route with the Command Group. Any Questions? The time is now H-Hour minus 45 minutes."

*We have an ASR of 21 rounds of HE and 3 smoke missions.

APPENDIX D

CASUALTY ASSESSMENT PROCEDURES

General. Weapon systems played in this experiment consisted of (a) tank main gun (105mm cannon), (b) TOW Heavy Antitank Weapon, and (c) indirect fire (155mm artillery). In general, direct fire casualties were assessed when a controller aboard a firing vehicle informed the controller aboard the target vehicle that the target vehicle had been hit. Indirect fire casualties were assessed when a simulated high explosive (HE) round impacted within a specified radius of a tactical vehicle. Firemarkers were primarily responsible for assessing indirect fire casualties. The following sections describe the specific procedures employed to assess the casualties inflicted by each type of weapon system. The casualty assessment procedures employed in this study followed those contained in TC 71-5, REALTRAIN, Tactical Training for Combined Arms Elements.

Direct Fire

Personnel. In all REALTRAIN exercises a controller was stationed aboard each tactical vehicle. REALTRAIN controllers were responsible for the timely and accurate assessment of casualties, for insuring that REALTRAIN rules and procedures were followed, and for insuring that casualties remained stationary and did not participate further in the exercise.

Equipment

Optics. Ten power telescopes were installed on all tanks and TOWs and were used by controllers to identify target vehicles during engagements. On the TOW, telescopes were mounted on top of the gunner's sight, and on tanks they were mounted in the main gun breech.

REALTRAIN Panels. Twenty-inch-square, two-digit number panels were mounted on all tactical vehicles in order to identify individual vehicles. Four panels were mounted on the four sides of all tanks, TOWs, and the forward observers' 1/4-ton vehicles. Also, one panel was mounted on the tank cupola, and one additional panel was carried by each TOW to be used if the TOW was employed dismounted. Controllers insured that REALTRAIN number panels were not obscured by camouflage.

Radios. AN/PRC-77 radios were used by all controllers to communicate among themselves and to the REALTRAIN net control station. Special headsets allowed controllers to monitor intra-tank communications.

Simulators. Tank weapon signatures were simulated using a Hoffman device. TOW signatures were simulated using either a TOW backblast simulator, or, when these became in short supply, a hand grenade simulator.

General Procedures. When a direct fire hit was made, the controller on board the firing vehicle transmitted the REALTRAIN panel number of the target vehicle, the words "hit by" and the panel number of his vehicle (e.g., "38 hit by 29"). The REALTRAIN net control station (NCS) logged this information. Next, the controller on board the target vehicle transmitted the panel number of his vehicle and the word "confirmed," (e.g., "38 confirmed"). The NCS logged the confirmation. Only confirmed hits were counted as casualties. After the target vehicle controller confirmed the hit, he set off a green smoke grenade to signify that the vehicle had been hit. Tanks were also required to traverse the main tank gun over the rear deck and all vehicles were required to raise a flag on their radio antennas.

In some cases, the panel number of the target vehicle could not be clearly distinguished. Here, the firing vehicle controller transmitted the grid coordinates of the target in lieu of the target panel number. The senior controller attempted to identify the target vehicle and, if successful, informed the target vehicle controller that his vehicle was a casualty.

Tank Procedures. When a crew fires at a target, the tank controller immediately looks through the 10x telescope mounted in the breech of the main gun. If the crosshairs of the telescope were on a target and if the tank main gun simulator is detonated, the controller transmitted a hit over the REALTRAIN net.

Any target receiving a direct hit from the 105mm main tank gun was considered destroyed. In addition, all exposed personnel or TOW weapon systems within 10 m of the target were destroyed.

TOW Procedures. When the TOW gunner began to acquire a target, the controller views the target through his 10x telescope. When the gunner triggered the TOW, the controller detonated a backblast simulator (or hand grenade simulator) to the rear of the TOW vehicle. In order to determine the time of impact of the missile, the controller had to estimate the missile flight time. Since the velocity of the TOW missile is approximately 200 m per second, the time of flight (in seconds) is equal to the range of the target (in meters) divided by 200 m/second. If the crosshairs of the controllers 10x sight were on target at the end of the estimated time of flight, then the controller transmitted a hit over the REALTRAIN net.

No casualty was assessed if (a) the missile path was obstructed by terrain features, foliage, etc., (b) if the target range was less than 65 m, and (c) if the target range was greater than 3000 m. Any target receiving a direct hit from a TOW missile was destroyed. In

addition, all exposed personnel or TOW weapon systems within 10 m of the target were destroyed.

Indirect Fire

General. Upon receipt of a smoke or high explosive (HE) fire mission, Fire Direction Center (FDC) personnel calculated the location of the incoming rounds and transmitted these to the firemarker nearest the location. The four firemarkers were responsible for delivery of all indirect fire missions and for assessing casualties resulting from HE missions.

When a firemarker received a mission from the FDC, he moved to the location specified. Firemarkers were aided in their land navigation by 16 numbered checkpoints located on key terrain features throughout the test area. They were also provided with 1:25,000 topographic maps which had the checkpoints indicated.

Upon arrival at the impact location, firemarkers detonated the rounds which had been requested. HE fire-for-effects and adjusting rounds were simulated with the use of ground burst simulators (M115A2). One round was detonated to simulate an adjusting round. Five rounds were detonated to simulate a fire-for-effect, placed at the center and corners of a 150 m by 300 m rectangle. White smoke grenades were used for smoke screening fire-for-effects.

Following delivery of the fire mission, the firemarker reported the delivery to the FDC and assessed casualties as appropriate. Casualties were assessed in terms of distance from the point at which HE simulators were detonated, as follows:

0-10 meters: Tanks lose mobility and commo. APCs and wheeled vehicles are destroyed. All exposed personnel are killed.

10-50 meters: Tanks lose comm. APCs and wheeled vehicles are destroyed. All exposed personnel are killed.

50+ meters: No effects.

Casualties were transmitted over the REALTRAIN control net in a similar form to direct fire casualties (e.g., "38 hit by indirect fire"). All request times, splash times, number of rounds delivered, impact location, etc. were recorded in the FDC. In instances where REALTRAIN controllers disagreed with firemarkers concerning assessed casualties, the decision of the senior tactical controller was final.

When the FDC was informed that the requested rounds had been delivered, they, in turn, informed the requesting unit. The FDC did not, however, inform the tested units or OPFOR of the effects of the indirect fire.

APPENDIX E

DATA FORMS

LIST OF DATA FORMS

<u>Form No.</u>	<u>Individuals Responsible for Completing Data Forms</u>
1	Field Scientist
3	FO Data Collector
4	Field Scientist
5	Fire Direction Center Data Collector
6	Net Control Station Data Collector
8	Test Unit Controllers
9	OPFOR Controllers

Data Form No. 1

NAME _____

TRIAL NO. _____

DATE _____

TESTED UNIT I.D. _____

TEST: PRE ____ POST ____

SENIOR FIELD SCIENTIST

Planning Phase

Warning Order.

1. Did the Platoon Leader issue a warning order to his subordinates?
Yes () No ()
2. If a warning order was issued, did it include:
 - a. Movement instructions to the unit? N/A () Yes () No ()
 - b. Location of enemy position? N/A () Yes () No ()*
 - c. Time of the attack? N/A () Yes () No ()

Supplementation of Information Provided in the CTC Attack Order

3. Did Platoon Leader move to a vantage point in the area of the attack position and make a personal reconnaissance? N/A () Yes () No ()
4. If the Platoon Leader makes a personal reconnaissance, was he accompanied by the FO? N/A () Yes () No ()
5. Did the Platoon Leader request additional information from the Company Commander? N/A () Yes () No ()
6. Did Platoon Leader discuss location of FO positions with the FO? N/A () Yes () No ()

Issuance of the Order

7. Did the Platoon Leader issue the order to all section leaders? N/A () Yes () No ()

Data Form No. 1 (continued)
Senior Field Scientist
Planning Phase

8. Was the order issued from a vantage point where the persons receiving the order could view the terrain? N/A () Yes () No ()
9. Did the attack order include:
- a. Information on OPFOR composition? N/A () Yes () No ()
 - b. Information on OPFOR location? N/A () Yes () No ()
 - c. Information on artillery support? N/A () Yes () No ()
 - d. Specific instructions to each section? N/A () Yes () No ()
 - e. Information about communications? N/A () Yes () No ()
 - f. Routes of advance for each section? N/A () Yes () No ()
 - g. Provisions for overwatch? N/A () Yes () No ()
 - h. Location of overwatch positions? N/A () Yes () No ()
 - i. Temporal coordination between overwatch and maneuver? N/A () Yes () No ()
 - j. Temporal coordination between smoke screening and maneuver? N/A () Yes () No ()
 - k. Temporal coordination between suppressive artillery fire and maneuver? N/A () Yes () No ()
10. Content of Order (Summarize order for each section with respect to overwatch positions and specific roles to be played by each section. Indicate routes of advance for each section on map).

Heavy Section:

Data Form No. 1
Senior Field Scientist
Planning Phase

Content of Order (continued)

Light Section:

TOW Section:

FO Section:

Data Form No. 1
Senior Field Scientist
Planning Phase

Provisions for temporal coordination between overwatch and maneuver:

Provisions for temporal coordination between smoke screening and maneuver:

Provisions for temporal coordination between suppressive artillery fire and maneuver:

FO DATA COLLECTOR
TU

Data Form No. 3

NAME _____

TRIAL NO. _____

DATE _____

TESTED UNIT I.D. _____

PHASE II III IV V VI

Platoon Leader's Order

1. Does Platoon Leader's order include:

- a. Location of planned fires Yes () No ()
b. Location of smoke screening Yes () No ()

2. Give location of each planned fire from PL's order:

1. _____ 2. _____ 3. _____ (8 digit coordinate)
Time: _____
4. _____ 5. _____ 6. _____
Time: _____
7. _____ 8. _____ 9. _____
Time: _____

3. Give location of each smoke screen from PL's order:

1. _____ 2. _____ 3. _____ (8 digit coordinate)
Time: _____
4. _____ 5. _____ 6. _____
Time: _____
7. _____ 8. _____ 9. _____
Time: _____

4. Location of initial observation point selected by FO (8 digit coordinate) _____ as determined by data collector.

FO DATA COLLECTOR OPFOR/TU

DATE _____

TRAIL NO. _____ RT NO. _____

TESTED UNIT I. D.

NAME

[illegible]

Data Form No. 4

NAME _____ TRIAL NO. _____
DATE _____ TESTED UNIT I.D. _____
TEST: PRE _____ POST _____

SENIOR FIELD SCIENTIST
DEFENSE

1. Did PL issue an order for the defense? Yes () No ()
2. Did PL assign a general location of the positions for:
 - a. Heavy Section Yes () No ()
 - b. Light Section Yes () No ()
 - c. TOW Section Yes () No ()
 - d. FO Yes () No ()
3. General locations assigned:
 - a. Heavy Section
 - b. Light Section
 - c. TOW Section
 - d. FO

Data Form No. 4 (continued)
Senior Field Scientist
Defense

4. Does PL assign a specific task to:

- a. Heavy Section
- b. Light Section
- c. TOW Section
- d. FO

Yes ()	No ()
Yes ()	No ()
Yes ()	No ()
Yes ()	No ()

5. Tasks assigned:

a. Heavy Section:

b. Light Section:

c. TOW Section:

d. FO:

Data Form No. 4 (continued)
Senior Field Scientist
Defense

6. Did PL order include preplanned artillery fire? Yes () No ()
7. Locations of preplanned artillery fire:
8. Did PL order include smoke screening missions? Yes () No ()
9. Location of smoke screening missions:
10. Did PL order provide for temporal coordination between artillery suppressive fire and maneuver? Yes () No ()
11. Provisions for coordinating artillery suppressive fire and maneuver were:
12. Did PL order provide for temporal coordination between smoke screening and maneuver? Yes () No ()
13. Provisions for coordinating smoke screening and maneuver were:

Data Form No. 4 (continued)
Senior Field Scientist
Defense

14. Did PL order provide for coordination of
overwatch and maneuver?

Yes () No ()

15. Provisions for coordinating overwatch and
maneuver were:

16. Did PL order provide:

- a. Check Points
b. Phase Lines
c. Audible Signals

Yes () No ()
Yes () No ()
Yes () No ()

FIRE DIRECTION CENTER

Trial No. _____	Test _____	1. _____	5. _____
Date _____	Training _____	2. _____	6. _____
Unit I. D. _____	Shoot-Off _____	3. _____	7. _____
Name _____	CAT _____	4. _____	8. _____

[illegible]

NET CONTROL SHEET

Date _____

TEST: PRE POST
(Circle One)

Trial No. _____

NAME: _____

Unit I.D. _____

TIME	EVENT
	1. CTC order is issued.
	2. Platoon Leader has issued order to platoon. START OPFOR, START Tac. Tape
	3. First element crosses LD, attack begins. START Rt. Tape
	3a. Consolidation of OBJ begins with remaining force, 20 min.
	4. Attack Module and consolidate end. STOP Tapes.
	4a. Admin. Halt, TU casualties are resurrected.
	5. Defense Module begins with full force, 20 min max. to consolidate. START all Tapes.
	6. Consolidation of Defensive Position Ends.
	7. OPFOR Counterattack Begins.
	8. Defense Module ends STOP all Tapes

ATTACK

DATE _____

TRIAL _____

TESTED UNIT						OPFOR					
Vehicle	Veh. No.	TC No.	Load No.	Dr. No.	Gun No.	Vehicle	Veh. No.	TC No.	Load No.	Dr. No.	Gun No.
TK PL						TK PL					
TK						TK					
TK						TK					
TK PSG						TK PSG					
TK						TK					
TOW LDR						TOW LDR					
TOW						TOW					
FO						FO					

[illegible]

DEFENSE/COUNTERATTACK

TRIAL

TESTED UNIT						OPFOR					
Vehicle	Veh. No.	TC No.	Load No.	Dr. No.	Gun No.	Vehicle	Veh. No.	TC No.	Load No.	Dr. No.	Gun No.
TK PL						TK PL					
TK						TK					
TK						TK					
TK PSG						TK PSG					
TK						TK					
TOW LDR						TOW LDR					
TOW						TOW					
FO						FO					

[illegible]

DATE _____
TESTED UNIT I. D. _____

OPFOR TANK/TOW

RT NO.

TRIAL NO. 1

NAME _____

CONTROLLERS

[illegible]

APPENDIX F

CRITERIA FOR ABORTED, INTERRUPTED, AND OMITTED TRIALS

- A. A trial will not be started if any one of the following criteria are met:
1. Any tested unit vehicle is not operational in the ECC area.
 2. More than one tested unit vehicle is not operational in the attack position.
 3. During Phase I, in one or more of the test unit crews:
 - a. The TC, gunner or driver is not MOS qualified; or
 - b. The TC, gunner or driver is not present.
 4. During Phases III or IV, in one or more of the tested unit crews, the TC, gunner or driver did not participate in Phase I.
 5. Any OPFOR vehicle is not operational in the ECC area.
 6. More than one OPFOR vehicle is not operational in the OPFOR initial start position.
 7. Some of the crew of any OPFOR vehicle (TC or gunner) has not been trained in the OPFOR duties and action sequences.
 8. Any platoon tactical net radio, REALTRAIN NCS radio or FDC net radio is not operational.
 9. The test lane has been judged untrafficable (determined by Senior Field Scientist and the Senior Tactical Controller).
 10. Weather is sufficiently inclement as to preclude meaningful exercise data to be gathered (determined by Senior Scientist and Senior Tactical Controller).
 11. One or more controllers are missing from either the tested unit or from the OPFOR.
- B. A trial will be interrupted for correction of operational problems if any one of the following criteria are met:
1. More than one tested unit vehicle or more than one OPFOR vehicle becomes nonoperational.

2. More than one of the controller radios becomes nonoperational on the NCS frequency.
 3. The REALTRAIN NCS radio(s) becomes nonoperational.
 4. Failure of the tested unit to follow critical elements of the CTC order. (Interruption of trial is a last resort: The Senior Tactical Controller and Senior Field Scientist will try to correct problems without interrupting the trial.)
 5. Failure of the OPFOR to follow the OPFOR scenario. (Interruption of trial is a last resort: The OPFOR Coordinator and the OPFOR Field Scientist will try to correct problems without interrupting the trial.)
 6. An injury occurs such that it would be dangerous for the injured party to continue the exercise.
- C. A trial will be shorted only if, in the judgment of the Test Director and the Senior Scientist, a condition listed in "A" or "B" (above) is sufficiently serious to preclude the safe conduct of the exercise or the collection of meaningful performance data.

APPENDIX G

PROCEDURES FOR ASSIGNING UNITS TO TREATMENTS

The procedure below will be followed in assigning test units to treatments (REALTRAIN (RT)) or conventional training (CT)).

From baseline test (Phase I) results:

1. Calculate ratio of track losses, tested unit/OPFOR, for each tested unit;
2. Determine operational time (total exercise duration less administrative times out) for each unit;
3. Multiply track loss ratio by operational time for each unit. Call the product P;
4. Rank units, within each cycle, by P;
5. In the first cycle, assign units ranked 1 and 4 to RT, ranks 2 and 3 to CT;
6. In the second cycle, assign units ranked 2 and 3 to RT, ranks 1 and 4 to CT.

APPENDIX H
GUIDANCE FOR TRAINERS

TEST TRAINING AND EVALUATION OUTLINE (TETEO)

UNIT: TANK PLATOON*

MISSION: PLANNING AND PREPARATION FOR MISSION

1. GENERAL CONDITIONS

For the past 2 days, the OPFOR has been withdrawing and has succeeded in breaking contact. Latest intelligence reports the OPFOR is preparing to defend, but the location of his main force is unknown. The tested unit consisting of a platoon of tanks, a TOW section and an FO section is a part of the flank guard of a larger force whose mission is to protect the exposed flank of the main body. The platoon's mission is to gain contact with the enemy, provide flank security to the main body, facilitate its movement, and eliminate any enemy resistance that is within the platoon's capability. During the conduct of the operation, the platoon will encounter an element of the enemy force which is equipped with tanks and anti-tank missiles. The evaluator/controller will vary the combat power of the OPFOR depending on the action desired on contact.

2. PRIMARY TRAINING/EVALUATION STANDARDS

To receive a satisfactory rating, the platoon must successfully meet these standards:

*Each time the word "platoon" appears in the unit context it applies to the tank platoon, with a TOW section and FO section attached.

- a. Demonstrate necessary troop leading procedures which portray a trained unit preparing for combat operations.
- b. Reflect the recognition of a division of leader responsibilities which result in effective use of available time and space.
- c. Portray responsiveness to higher unit commands and coordination, and to the formulation of implementing orders.

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&E to indicate the unit's proficiency on each task for this mission. Phase II trainers/evaluators will record detailed observations of training deficiencies which need training emphasis on an attached sheet of paper. This T&E and attached sheets should provide the basis for continuous training during the period. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and from the evaluator/trainer subjective judgment as to whether or not the unit would have been successful on the modern battlefield had it performed as it did in this exercise.

Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

Overall Proficiency:

SAT

UNSAT

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: PLANNING AND PREPARATION FOR MISSION.

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
<p>1-1 To portray the procedures employed by a well-trained combat unit preparing for combat operations.</p> <p>2-1 Application of necessary troop leading procedures at Platoon and subordinate leader levels.</p> <p>3-1 Recognition and use of time and space, by employing a knowledge of the chain of command and tactical SOP's.</p> <p>4-1 Practice of a division of tactical responsibilities within and between the tank crew, the section, and the</p>	<p>In daylight under tactical conditions: Crew Members perform vehicular, weapons, communication, checks in accordance with unit standard operating procedures, or as required by safe operating practices and a high degree of combat preparedness.</p> <p>Platoon leader moves his unit from the Ready Line to the Attack Position, receives a Company Team OPORD and issues a fragmentary operations order to the subordinate section leaders.</p> <p>Radio communications are held to a minimum or IAW orders of platoon leader (e.g., radio silence).</p>	<p>While on the Ready Line note the division of responsibilities among crew/section/platoon.</p> <p>Their use of time available and conduct of checks and necessary adjustments in accordance with priority:</p> <ol style="list-style-type: none"> 1. Vehicle 2. Armament 3. Ammunition 4. Communications 5. Secondary armament 6. Crew welfare/safety <p>Check their report of statistics to next higher echelon, and radio checks with company team, intraplatoon command net, and fire request net.</p> <p>Is the order issued at a vantage point, or OP if such selection aids understanding or clarity of mission? Fragmentary order is brief, concise and covers essential detail regarding:</p> <ol style="list-style-type: none"> 1. Information of the enemy. 2. Information of own supporting troops. 3. General plan of the platoon leader to 		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: PLANNING AND PREPARATION FOR MISSION (continued)

OVERALL MISSION RATING:

--

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
platoon, in order to develop information required for a proper operations order.		<p>accomplish his task (concept of the operation).</p> <p>4. Specific orders to each subordinate element.</p> <p>5. Changes or additions to unit SOP's, or in command, control, communications.</p> <p>Special note should be made of the unit's use of available time, e.g., did platoon sergeant move the unit from the Ready Line to the Attack Position while the Platoon Leader used this time to make a personal reconnaissance?</p>		

SUGGESTED SUPPORT REQUIREMENTS (EVALUATION)
TANK PLATOON: PLANNING AND PREPARATION FOR MISSION

1. Administration: A team order must be prepared in advance by the evaluator for issue to the platoon leader. This OPORD will be utilized to lead into the continuing tactical mission (e.g., hasty attack followed by a defense and retrograde movement.)
2. Minimum Evaluators: 1 CPT, 1 LT/NCO. When REALTRAIN procedures are used the requirement will increase to at least one controller/evaluator per tank and crew served weapons.
3. Threat: 1 tank section, 1 TOW section, 1 FO section (exact number of aggressors must be determined by the evaluators based on action desired at contact).
4. Support Troops: TBD.
5. Vehicle/Communication: TBD.
6. Maneuver Area: A route of advance 6 - 8 km long and approximately 5 km wide.
7. Firing Area: None.
8. Training Aids, Devices, and Special Equipment: REALTRAIN equipment, tank main gun, artillery and ATM fire simulators.
9. Ammunition: TBD.
10. Key References: FM 17-1, and TC 71-5.

TANK PLATOON: PLANNING AND PREPARATION FOR MISSION (continued)

11. Tips for Trainers/Evaluators: During the standard field training exercise, one evaluator should act as the team commander on the team radio net. Radio contact should be maintained with the threat element to control their fires/actions. One evaluator should be located with threat element to evaluate tested platoon's proficiency in using terrain, suppressive/supporting fires, and movement techniques. . This will permit the evaluator to make judgments based upon observation made from the "enemy" point of view as to how well the tested platoon performed this mission. REALTRAIN control procedures will be used for REALTRAIN based field training.

TEST TRAINING AND EVALUATION OUTLINE (TETEO)

UNIT: TANK PLATOON

MISSION: MOVEMENT TO CONTACT

1. CONDITIONS

The platoon is located in a concealed attack position which is in defilade from OPFOR. Departing the Attack Position, the platoon crosses the Line of Departure and adopts a technique of movement which is determined by the unit leader. The unit is not in contact with OPFOR. The Line of Departure may be used as the location of overwatch positions if the terrain is considered suitable.

2. PRIMARY TRAINING/EVALUATION STANDARDS

To receive a satisfactory rating, the platoon must successfully meet these standards:

- a. Conduct the movement with proper use of movement techniques, the terrain, and suppressive fires to maximize the combat power of the platoon and minimize its exposure and vulnerability to enemy fire.
- b. Determine the enemy's disposition and successfully develop the situation through application of proper tactical principles without sustaining excessive personnel casualties and equipment loss. (Evaluator judgment for standard type field exercises.)
- c. Demonstrate responsiveness to commands and coordination within the platoon, and to emergency situations as they occur.

MISSION: MOVEMENT TO CONTACT (continued)

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&E to indicate the unit's proficiency on each task for this mission. Phase II trainers/evaluators will record detailed observations of training deficiencies which need training emphasis on an attached sheet of paper. This T&E and attached sheets should provide the basis for continuous training during the period. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and from the evaluator/trainer subjective judgment as to whether or not the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

Overall Proficiency:	SAT	UNSAT
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TRAINING AND EVALUATION

OVERALL MISSION RATING:

UNIT: TANK PLATOON
MISSION: MOVEMENT TO CONTACT

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
I-II Establish and maintain physical and C&E security measures in the attack position.	In daylight under tactical conditions: a. Platoon Leader has presented his OPORD to his unit. b. Mortar and artillery fires are available subject to priorities. c. The attack position is being secured by friendly forces.	All types of security measures are required in the attack position. The two sub-tasks described, security operations and conduct of the unit movement should be carried out quickly. The division of responsibilities within the crew should be noted to determine the speed and coordination with which each task is accomplished.		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: MOVEMENT TO CONTACT (continued)

OVERALL MISSION RATING:

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TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
2-II Use of proper movement techniques.	Considering the above, the platoon moves out of the attack position.	Correct movement techniques are used by the unit: It uses traveling when contact is not likely, traveling overwatch when contact is possible and bounding overwatch where contact is likely. The platoon's execution of these movement techniques optimizes the use of terrain to minimize its exposure and to maximize its ability to deliver suppressive fires from the best available overwatch position. OP's will be established when it is infeasible to occupy the firing position with the TOW tank. The platoon's movement must be characterized by aggressiveness and must maintain the momentum of the approach march utilizing cover and concealment.		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: MOVEMENT TO CONTACT (continued)

OVERALL MISSION RATING:

--

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
3-II React to enemy contact.	Platoon is engaged by enemy ATM or tank fire.	Reconnaissance by both direct and indirect fires are used when they provide adequate coverage of the selected routes of march. Platoon promptly takes cover and returns the fire. The situation is developed by personal reconnaissance by leaders, reconnaissance by fire, and maneuver. Platoon subordinate leaders report to the tested unit leader the strength and location of the enemy. Action is decisive and positive. Maneuver should demonstrate an effective division of responsibilities and maximum coordination within platoon, in addition to an appreciation of enemy situation and terrain conditions.		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: MOVEMENT TO CONTACT (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING
		<p>Reports as to friendly locations and the nature of terrain are submitted by secure means on a timely basis. Information as to OPFOR activities are reported in the clear.</p>	

SUGGESTED SUPPORT REQUIREMENTS (EVALUATION)

TANK PLATOON: MOVEMENT TO CONTACT

1. Administration. A team order must be prepared in advance by the trainer/evaluator for issue to the platoon leader. This OPOD should be utilized to lead into the continuing tactical mission.
2. Minimum Evaluators: 1 CPT, 1 LT/NCO. When REALTRAIN procedures are used the requirement will increase to at least one controller/evaluator per tank and crew served weapon.
3. Threat: 1 tank section, 1 TOW section, 1 FO section (exact number and organization of OPFOR may be determined by the evaluators based on action desired at contact).
4. Support Troops: TBD.
5. Vehicle/Communication: TBD.
6. Maneuver Area: A route of advance 6 - 8 km long and approximately 5 km wide.
7. Firing Area: None.
8. Training Aids, Devices, and Special Equipment: REALTRAIN equipment, tank main gun, artillery and ATM fire simulators.
9. Ammunition: TBD.
10. Key References: FM 17-1, and TC 71-5.

TANK PLATOON: MOVEMENT TO CONTACT (continued)

11. Tips for Trainers/Evaluators: For standard field exercises, one evaluator should act as the team commander on the team radio net. Radio contact should be maintained with the threat element to control their fires/actions. One evaluator should be located with threat element to evaluate tested platoon's proficiency in using terrain, suppressive/supporting fires, and movement techniques. This will permit the evaluator to make judgments based upon observation made from the "enemy" point of view as to how well the tested platoon performed this mission. REALTRAIN based field training will be IAW TC 71-5.

TRAINING AND EVALUATION OUTLINE (TETEO)

UNIT: TANK PLATOON

MISSION: CONDUCT OF THE ATTACK

1. CONDITIONS

The platoon is in contact with the enemy and will conduct a hasty attack. The OPFOR consists of tanks and ATMs. The platoon leader has been given a Company Team OPORD which directs him to "protect the main body", and to attack and destroy OPFOR within his capabilities. He must issue necessary frag orders to his subordinate elements.

2. PRIMARY/TRAINING EVALUATION STANDARDS

To receive a satisfactory rating, the platoon must:

- a. Conduct the hasty attack taking appropriate action (e.g., destroy or fix enemy and request support) without sustaining excessive personnel casualties and equipment loss. Positive actions are required of the platoon in order to develop the situation fully, and apply all the combat power available.
- b. Upon destroying OPFOR or seizing a designated terrain objective, the TU consolidates and prepares for the defense of an area.

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&E to indicate the unit's proficiency on each

MISSION: CONDUCT OF THE ATTACK (continued)

task for this mission. Trainers/evaluators will record detailed observations of training deficiencies which need training emphasis on an attached sheet of paper. This T&E and attached sheets will provide trainer a basis for continuous training during the period. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and from the evaluator/trainer/controller subjective judgment as to whether or not the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

Overall Proficiency:

SAT

UNSAT

TRAINING AND EVALUATION

UNIT: TANK PLATOON
MISSION: CONDUCT OF THE ATTACK

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
I-III Conduct Hasty Attack..	Platoon takes cover, returns fire, reports initial contact.	Platoon elements rapidly disperse, maintaining the integrity of each section. Platoon quickly engages the enemy. Fire control and distribution process account for the placing of the correct weapon/ammunition type on the target. Each tank/TOW is provided cover from the enemy fire. Action is taken to extract any element pinned down or otherwise exposed to enemy fire, and unable to contribute to the platoon's combat power.		
2-III Recognize and use of information available.	Each leader should place himself in a location from which he can secure the information desired in order to make an estimation of the immediate situation. Platoon Leader makes his personal reconnaissance and using inputs, if appropriate, from section leaders, completes his estimate; makes his decision and communicates the current enemy situation, and his decision to the Company Team Commander.	Leaders use multiple means of determining inputs to each estimation of the situation. These are: 1. Personal observation. 2. Information from higher, lower and adjacent elements.		
3-III Develop information required to complete PL estimate.				
4-III Provide security.				
5-III Transmit PL's decision to subordinate elements.				
6-III Make necessary adjust-				

TRAINING AND EVALUATION

UNIT: TANK PLATOON
MISSION: CONDUCT OF THE ATTACK (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
<p>ments to the platoon's disposition rapidly and without the requirement for excessive control.</p> <p>7-III</p> <p>Integrate the indirect fire plan with the scheme of ground maneuver.</p> <p>8-III</p> <p>Reflect the use of planned fire and maneuver during the execution of the attack.</p> <p>9-III</p> <p>Demonstrate the use of</p>	<p>Tested unit maintains a moderate volume of fire on the enemy position to assist Platoon Leader in developing situation. In accordance with initial team order (issued in the Attack Position), the platoon attacks immediately to regain or retain the initiative.</p> <p>:</p> <p>:</p> <p>:</p>	<p>The Platoon Leader communicates his decision to the tank, TOW and FO section leaders. Platoon Leader's coordination, and requirements for support from the TOW and FO sections are in the form of mission type orders. TOW section leader selects his positions to support from a general area designated by the Platoon Leader. FO Section plans fire in support of the platoon attack based upon requests from Platoon Leader. Additional defensive fires on targets of opportunity are attacked by FO without referring to Platoon Leader.</p> <p>Platoon Leader scheme of maneuver uses principle of fire and movement. TOW's</p>		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: CONDUCT OF THE ATTACK (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
both on board weapons and indirect fires. 10-III Secure the objective area.		are placed in overwatch position and place suppressive fires on the enemy position as the tanks maneuver using bounding over-watch. Artillery fires are placed on the objective area in an attempt to destroy or suppress the enemy. Both fires of TOW and artillery are shifted, upon pre-arranged signal, to flanks of objective area or on targets of opportunity in the rear of the enemy positions. Tanks maneuver by section and in mutual support. Each tank employs the most effective weapon/ammunition combination to engage the enemy target. Smoke is used to screen the movement of the friendly		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: CONDUCT OF THE ATTACK (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		<p>force elements where natural concealment and cover is lacking.</p> <p>Platoon uses reconnaissance by fire to develop enemy situation.</p> <p>Targets of greater potential danger are engaged first.</p> <p>Fire control techniques are employed to ensure coverage of the objective area in the event precise enemy target locations are unknown.</p> <p>Correct combat gunnery processes used by each crew engaging a target.</p> <p>The objective is reported secure to the Company Team Commander.</p> <p>Movement is oriented on the enemy, units do not back track, make false starts, or</p>		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: CONDUCT OF THE ATTACK (continued)

OVERALL MISSION RATING

TRAINING OBJECTIVES	CONDITINS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		<p>otherwise display a lack of terrain appreciation which could leave them exposed to enemy observation for unacceptable periods of time.</p> <p>Platoon reorganizes quickly, security provides for both local and distant threats. All likely avenues of approach are covered. OP's are established if such increases the platoon capability to apply combat power to its area of interest. Division of responsibility during this critical phase should clearly provide for objective consolidation without unnecessary or undue movements, excessive communications or detailed orders</p> <p>The tested unit should redistribute combat</p>		
	<p>Report combat status of unit to next higher headquarters including the location and disposition of both friendly and enemy forces.</p>			

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: CONDUCT OF THE ATTACK (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		power and tactical responsibilities as a result of casualties suffered (evidence of unit SOP or practical training).		

TRAINING AND EVALUATION OUTLINE (TETEO)

UNIT: TANK PLATOON

MISSION: DEFENSE AGAINST COUNTERATTACK

1. CONDITIONS

The platoon has been ordered to defend. The company team has designated general position areas to occupy and have established a time priority for preparation for the defense. After preparation of its defensive area, the platoon will be struck by a tank-led counterattack and as the result of overall enemy successes, will be ordered to delay back to a company team designated initial delay position.

2. PRIMARY TRAINING/EVALUATION STANDARDS

To receive a satisfactory rating, the platoon must organize or occupy their primary positions within the time specified by the Company Team Commander, reconnoiter routes to and establish alternate positions, and defend from mutually supporting battle positions. Finally to wear down and disrupt the movement of the counterattacking enemy force.

3. TRAINING/EVALUATION RESULTS

Check SAT or UNSAT on the following pages of this T&E to indicate the unit's proficiency on each task for this mission. Trainers/evaluators will record detailed observations of training deficiencies which

MISSION: DEFENSE AGAINST COUNTERATTACK (continued)

need training emphasis on an attached sheet of paper. This T&E and attached sheets should provide the trainer a basis for continuous training during the period. The overall proficiency rating for this mission is determined from the performance of the unit on each task, the primary training and evaluation standards, and from the evaluator/trainer subjective judgment as to whether or not the unit would have been successful on the modern battlefield had it performed as it did in this exercise. Circle one of the following to indicate the overall combat proficiency of the unit on this mission:

Overall Proficiency:

SAT

UNSAT

TRAINING AND EVALUATION

OVERALL MISSION RATING:

UNIT: TANK PLATOON
MISSION: DEFENSE AGAINST COUNTERATTACK

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
I-IV To plan and conduct a mobile type defense.	It is daylight and platoon has been successful in driving the enemy off its objective area. The team commander has ordered the platoon to prepare the defensive position and be prepared to withdraw on order and delay to designated delay positions.	Satisfactory performance of the platoon is demonstrated by: The Platoon Leader issuing a fragmentary order to key leaders of his platoon (section sergeant is minimum acceptable level, each tank commander, is practical ideal). He must coordinate the necessary requirements for support with TOW and FO section leaders. The order and coordinating activities should include the following information: 1. Information of the enemy 2. Mission of the Company Team 3. Mission of the platoon 4. Initial plan of the platoon leader,		
2-IV To demonstrate knowledge of techniques of both selection and occupation of a defensive firing position.	The Platoon Leader must interpret the defensive tasks assigned by the Company Team Commander and prepare and deliver his own plan of operations. TOW section must provide necessary support to the tank platoon. FO section will prepare			
3-IV To reflect the division of responsibilities within the tank crew, tank/TOW section and platoon in achieving				

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: DEFENSE AGAINST COUNTERATTACK (continued)

OVERALL MISSION RATING:

--

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
Objectives 1 and 2 above.	and coordinate the details of the artillery fire plan with the supported units.	including necessary contingency plans.		
4-IV				
To defend against a tank led counterattack with fire and maneuver.	Both direct and indirect fires are coordinated, controlled and distributed. Platoon occupies the battle position and organizes the defensive position.	5. Specific orders to each tank section. 6. Mission type orders, requests and coordination with TOW and FO sections. 7. Measures not covered by unit SOP's. Route of approach and the selection and occupation of firing positions should indicate prior preparation through either personal or map reconnaissance. Division of responsibilities within the tank crew/section and platoon should be apparent, each member contributes to the accomplishment of each combat task or function. Platoon Leader fights his own section as well as controls and coordinates the movement or activities of the light section.		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: DEFENSE AGAINST COUNTERATTACK (continued)

OVERALL MISSION RATING:

--

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		Platoon occupies firing positions with tank/TOW only when weapon is not under possible observation by the enemy. Initial firing positions are mutual supporting, indirect fires are integrated into the defensive fire plan to account for those areas not covered by direct fire. Firing positions selected provide opportunity to open fire at the maximum ranges. Covered route of movement into or out of each position available.		
	Platoon conducts an active, mobile type defense against a tank led enemy force.	Tanks and TOWs open fire at the maximum range. Firing positions are changed after each engagement, maximum exposure to enemy fire does not exceed 9-12 seconds.		

TRAINING AND EVALUATION

OVERALL MISSION RATING:

UNIT: TANK PLATOON

MISSION: DEFENSE AGAINST COUNTERATTACK (continued)

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		<p>Tanks are TOWs fire alternately by sections, and fire platoon volley fire when such is feasible.</p> <p>Dismounted observers are used forward to guide tank into firing position when it is infeasible to occupy the position with the tank itself.</p> <p>Priority communication between tanks is:</p> <ol style="list-style-type: none"> 1. Voice 2. Signal (flag or hand and arm) 3. By example 4. Radio <p>Tanks and TOWs engage the enemy at maximum ranges, using covered routes into and out of firing positions.</p>		

TRAINING AND EVALUATION

UNIT: TANK PLATOON

MISSION: DEFENSE AGAINST COUNTERATTACK (continued)

OVERALL MISSION RATING:

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		<p>Tanks will remain exposed for minimum periods of time during firing (12 to 15 seconds when anti-tank "K" kill type weapons system are suspected). These correct gunnery processes will decrease exposure time:</p> <ol style="list-style-type: none"> 1. Target acquisition 2. Fire distribution 3. Fire commands 4. Crew duties 5. Accuracy of fire 6. Fire control (firing alternatively by section, by individual tank or by platoon volley) 		

TRAINING AND EVALUATION

OVERALL MISSION RATING:

UNIT: TANK PLATOON
MISSION: DEFENSE AGAINST COUNTERATTACK

TRAINING OBJECTIVES	CONDITIONS	TRAINING/EVALUATION STANDARDS	RATING	
			S	U
		<p>Maneuvering tanks within a section should avoid occupying same firing position as one just vacated by a firing tank. Alternate firing positions are selected preferably on alternate (different) terrain features. Fire control and distribution should be evidenced through use of massed or volley fires to include overhead artillery and supporting TOW fires. TOW and FO Sections move to alternate positions without orders from the Platoon Leader so as to ensure continuing support to the attacking platoon.</p>		

SUGGESTED SUPPORT REQUIREMENTS (EVALUATION)

TANK PLATOON: DEFENSE AGAINST COUNTERATTACK

1. Administration: Defense orders and enemy counterattack plans should be prepared in advance.
2. Minimum Evaluators: 1 CPT, platoon evaluator; 1 LT/NCO assistant evaluator. When REALTRAIN procedures are used, the requirement will increase.
3. Threat: 1 tank platoon, 1 TOW section, and 1 FO section.
4. Support Troops: TBD.
5. Vehicles/Communications: TBD.
6. Maneuver Area: A sector 1.5 - 3 km wide, 1 - 5 km deep, with 1 - 1.5 km observation to front and suitable primary and subsequent battle positions with likely avenues of approach for the enemy counterattack force.
7. Firing Area: None.
8. Training Aids, Devices, and Special Equipment: Tank main gun fire simulators, REALTRAIN equipment, artillery and TOW simulators.
9. Ammunition: TBD.
10. Key References: TC 17-12-1, TC 17-12-3, FM 17-1 and TC 71-5.

TANK PLATOON: DEFENSE AGAINST COUNTERATTACK (continued)

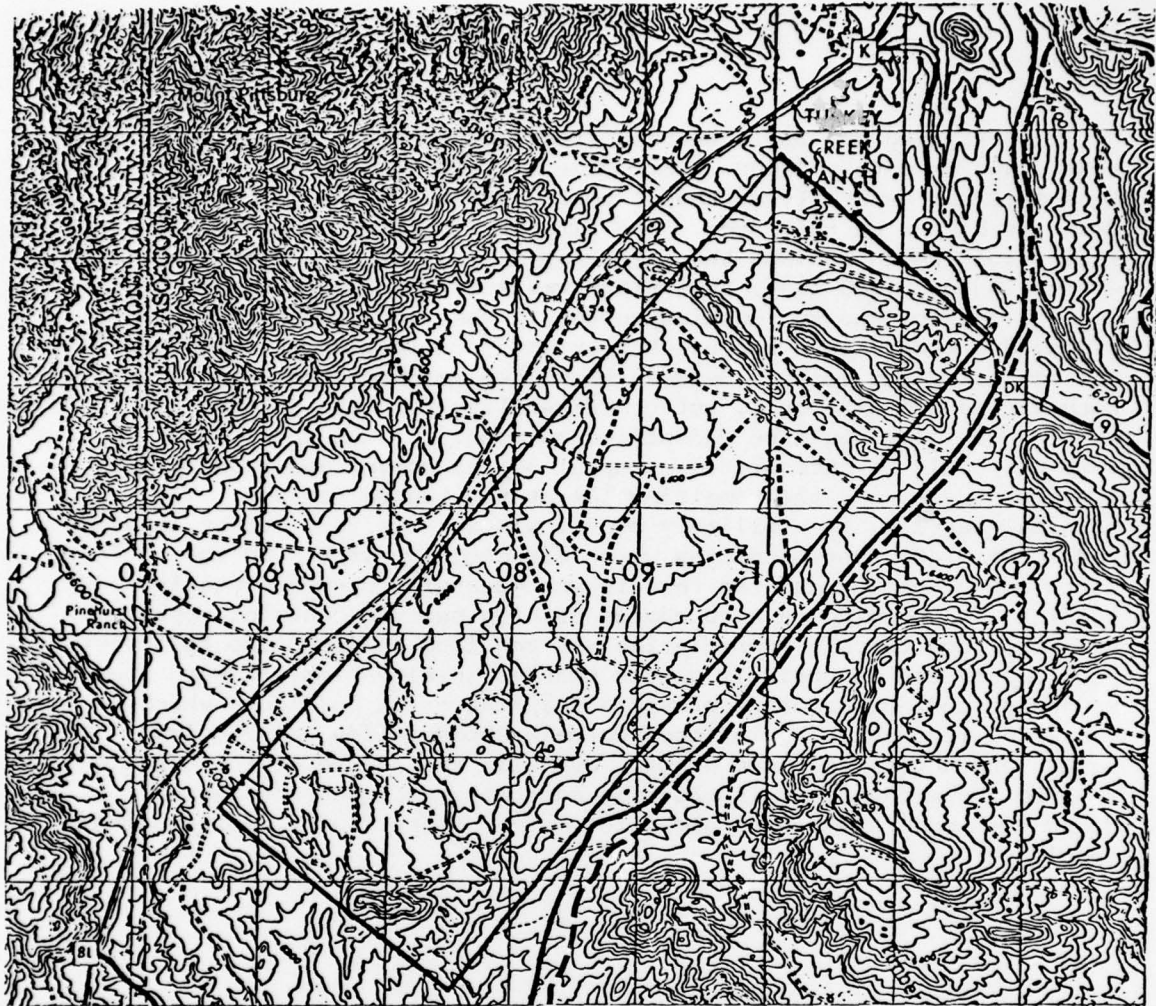
11. Tips for Trainers/Evaluators:

- a. Observe and evaluate platoon movement techniques and use of cover and concealment in the battle position from threat force positions.
- b. Monitor platoon radio to evaluate adequacy of OPSEC, orders, reports, and requests.
- c. Observe the actions of the platoon from positions within the enemy counterattack force as well as other vantage points within the friendly defensive area.

APPENDIX I

TERRAIN

The training and field testing area was roughly rectangular in shape, approximately 3,000 meters wide by 7,000 meters long. The long axis ran generally northeast to southwest. Two key terrain features dominated this area. The first was a ridge, about 3,000 meters long which crossed the northeast end of the area. With an evaluation of 6,600 feet, this ridge was some 200-300 feet above the general level of the surrounding terrain. The second feature was a ridge, 800 meters long and 6,450 feet in elevation, which dominated the southeast extremity. Between these two features the terrain was both varied and difficult, but trafficability for both tracked and wheeled vehicles could be classified as good. Of the total area, some 60% could be categorized as open, 30% as wooded and requiring close maneuver, and the remaining 10% as too rugged for use. The critical terrain, in a military sense, was a ridge 2500 meters long and about 6,400 feet elevation which bisected the area. To the northeast of this ridge the terrain was generally open and gently rolling, and provided a wide choice of high speed avenues of approach. However, good terrain appreciation was required to recognize the cover provided by the deceptively gentle changes in elevation. Toward the southeast end, three draws provided deep-cut cross corridors which canalized movement. Again, good terrain appreciation was required to use and negotiate these draws. Overall, the nature of the terrain favored the attacker as it provided adequate cover and concealment along with sufficient open areas for mutual support among maneuvering sections.



TERRAIN USED IN PRE-TRAINING AND POST-TRAINING TESTS

APPENDIX J

TEST NARRATIVE

SOUTH TO NORTH LANE

PL Attack Order

The order was issued from a vantage point where the unit could view the terrain. All vehicle commanders were present when the order was issued.

The platoon leader planned to attack the objective on the eastern flank with the heavy section while the light and TOW sections provided overwatch for the attacking element. The light section and one TOW were to travel towards the objective using a route which was in the general vicinity of the following coordinates: 073690, 080686, 084690, and 085700. The light section and TOW were then to remain south of the objective and cover the attack by the heavy section. The heavy section and one TOW were ordered to travel towards the objective via a route bordering Highway 11 to a point in the vicinity of 102701. The TOW was then to provide overwatch from the high ground at 103705 while the heavy section moved towards the objective.

The heavy section and one TOW were to move out of the attack position and move to an overwatch position at a point crossing grid 690. This element was then to provide overwatch for the light section and TOW as the latter element moved to a point where their route of advance intersected grid 690. The light element was then to provide overwatch for the heavy element as the latter moved to the intersection of their route of advance and grid 700. The light element was then to move to grid 700 while the heavy element provided overwatch. From that point in time the light element was to overwatch the heavy element from the vicinity of grid 700. Overwatching elements were to notify maneuvering elements that overwatch had been provided by giving the message "set" over the radio.

The FO was assigned to travel with the heavy section. The PL order included a request for smoke screening at 092708 to cover the attack on the objective. This mission was to be registered. The PL ordered the FO to provide preplanned H.E. on the objective. No mention was made of the time when these missions were to be employed.

PL Defense Order

The order was not issued from a vantage point where the unit could view the terrain. All vehicle Commanders were present when the order was issued.

The PL believed that the enemy would attack the objective via the western avenue of approach, and the PL said it was unlikely that the enemy would attack across the open ground to the east of the objective. The elements were thus assigned so as to cover the western approach. No elements were assigned to the eastern boundary of the objective. The light section was ordered to take up positions on the north central edge of the objective. The TOWs were assigned to positions on the western boundary of the objective. The heavy section was assigned to the north-western edge of the objective. The positioning of the light section provided some cover of the eastern approach.

The PL told the TOW section to ground-mount their weapons and he told the tank commanders to send out OPs.

The PL requested H.E. missions in the general vicinity of 087713 and 082718. These locations were selected because of the PL's expectations of an attack from the northwest. Provisions for the times when these fires were to be provided were not included in the order.

The Attack Tested Unit

Six of the tested unit crews were not briefed on the attack order given by the Platoon Leader. There was some confusion as they started to leave the assembly area about who was going to go where. There was no one left in overwatch. The heavy section took the low ground out of the attack position, so their movement was covered and concealed. The light section and the TOWs moved across the LD, moving north simultaneously with no one in overwatch position.

OPFOR Point of View: The tanks moved like columns of ducks. They followed each other--came out of the woods and stopped in the center clearing and were dead shots. The TOWs moved very well. The OPFOR tank 37 saw 56 and shot him. 56 was moving well, but not quite well enough. 80 moved right near where 56 got shot. He just pulled up a little too far in the woodline and the OPFOR got him.

How many of the tested unit vehicles were seen crossing the LD shortly thereafter? The only one seen near the LD was 24, and he was shot by 20. Then 3 minutes later, 13 was shot. Within 6 minutes they got the light section. They moved badly with the exception of the TOWs. Right. It's probably significant that the TOWs 56 and 80 were hit not by the OPFOR TOWs, but by the OPFOR light section.

The general route selected by the Platoon Leader did afford cover and concealment. That is why they were not picked up initially as they moved out of the assembly area. The light section deviated from the route indicated by the Platoon Leader. They crested early, and of course they were the first two to go. The light section and TOWs were moving in generally the same direction, but they were not covering each other. They were moving independently. There was not a single transmission between the Platoon Leader and his light section, or between either section of the tanks and TOWs. There was absolutely no coordination. When the light section bought it, the TOWs were left on their own. The heavy section Platoon Leader had gone clear south of Peanut Mountain, instead of attacking north. He was three grid squares south of that mountain before he figured out where he was.

The TOWs continued to move, and the controllers asked them, "Where are your tanks?" Neither one of the TOW section leaders had the foggiest idea about the location of the tanks or made any attempt to try to call them. The TOWs, after the light section moved, continued to move in covered and concealed routes. However, the TOWs were just moving one behind the other in the attack. Why? I don't know. They were very noisy in their movement. That's how the OPFOR initially picked them up. They were crossing open areas. The OPFOR was occupying those areas which they were trying to get across. For a good portion of the attack, the TOW section was leading the attack and didn't know it. They both poked out of the woodline and were killed.

The heavy section finally got turned around and headed back north. They got clear out of that major creek east of it, just on the other side of Tank Trail 11 and were moving right across the open, across that ridgeline and moving right in line, 1, 2, 3.

Where they went south is off the maps, I take it.

Right--they circled back around north and then in the vicinity of 084684. Somewhere from thereabouts. The first tank got hit and the next two tanks continued to move. They moved right up behind them and around dead vehicles. The TOW took them, 1, 2, and 3.

The FO elected to move with the TOWs after he had problems with his vehicle. He never called any fire missions.

No one in the tested unit ever detected an OPFOR vehicle of any kind. Again a couple of controllers indicated that they saw OPFOR vehicles and should have been some observation of TOW 20 and TOW 41 when they engaged the vehicles. The Platoon Leader split his elements. He did not attempt to communicate with them to find out if they were on their route or if they were doing what they were supposed to do. Thus, their movement was not coordinated. Part of the problem was that he was so far south of that mountain that he could not talk to them.

Defense

Again, 6 of the 8 crews were not briefed on the defense order. The Platoon Leader did take the heavy section and the TOW section commanders up and pointed out the locations where he wanted them. One of the TOWs failed to occupy a position he had indicated, and thus both TOWs ended up in the western sector. One TOW was supposed to be overlooking the eastern flank of the objective.

What did the OPFOR see as the TU moved into position?

TOW 20 saw Tank 24, Tank 29, and another tank. TOW 41 saw what they thought was 39. The heavy section saw 39, 36, and 22. They had general location on 80 and 56. They couldn't tell who 56 was because he didn't have his number up front. The OPFOR thought the set-up of the TU was outstanding. Their area movement was not too bad, but they had smoke and noise all over the place. The TU selected good fire positions, but the TU was not really disposed to accomplish their mission.

The Platoon Leader had only one vehicle in the position to cover the eastern flank. He did not have enough elements to cover his eastern approaches to the objective. He was disposed fairly well to cover the movement of the heavy section from the west because most of his elements were in that location. The Platoon Leader was the first to get killed, and the FO was with the Platoon Leader. With the first shot, the Platoon Leader and all the indirect fire capability was gone. No other TC ever elected to get up on the net and use indirect fire, so the tested unit did not fire any indirect fire. Tanks 13 and 36 crews had ample opportunity with their observers out to pick up movement of the heavy or the light section, but neither saw the OPFOR until the very last minute. All the tanks were kept running in the defense. They couldn't hear very well but their observers that were forward had observation of the area where there was movement. They failed to report their observations.

There were some fairly good positions picked within the defense area, but the observation was not that good. And there was no coordination between the elements. There were three elements placed within about 50 meters of each other, two TOWs and Tank 13, when the fire mission came in. When the OPFOR fire-for-effect came in, all three vehicles were effectively damaged. They lost both TOWs and two of the crew members on Tank 13. The damage inflicted caused the remaining crew members on Tank 13 to pick up and move out of the area. They moved right into the OPFOR light section and were destroyed. The entire western sector was then open to the OPFOR. As the OPFOR approached the objective, they detected the last tested unit tank. It was not until the last minute that the tested unit tank decided that somebody was in front, and it pulled right out in the open to try to engage. The OPFOR hit the last TU tank. There was no communication after the Platoon Leader and the Platoon SGT were hit, and they were the first two vehicles to go. None of the other tanks or TOWs communicated with each other.

It appeared that the test unit never really got into a final position. The first vehicle that was hit was 39, and 39 was still moving. Everybody was set up except for the heavy section. The heavy section was still moving with the Platoon Leader, and they had not settled down into defensive positions when the consolidation period was up. They moved out on time, but the heavy section was late moving into position. The Platoon Leader physically ground guided the light section to position. The Platoon Leader's tank did not know where he was. The heavy section was just left sitting without any guidance until the PL came back to get his heavy section. He put the heavy section in one location and then decided he did not like it. He pulled out and moved down the creek. By that time, he had used up about all of his time.

The OPFOR, in fact, had accomplished the mission at 1427. They were on the objective and moving to the Checkpoint 17.

What time did the exercise begin?

The exercise began at 1403.

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